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Early Childhood Practitioners' Views on the Use of Technology with Young Children

By:

Heather Macdonald

A thesis submitted in partial fulfilment of the requirements for the degree of Doctor of Education

The University of Sheffield
Faculty of Social Sciences
School of Education

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Abstract

This thesis examines the attitudes of early childhood practitioners regarding the use of technology with young children. The study utilised qualitative methods to investigate the range of attitudes that exist towards the use of technology with young children, as well as to explore the factors which have led to the practitioners' attitudes. In phase one of the research, four focus groups with a total of twenty-two participants were held to begin to understand the range of attitudes that exist and to select participants for phase two. In phase two, ten participants were selected from the focus groups who represented the full range of attitudes expressed, from extremely negative at one end to extremely positive at the other. These ten participants engaged in in-depth interviews to explore their attitudes towards the use of technology with young children. Findings suggest that the attitudes of early childhood practitioners towards technology use with young children are more nuanced than simply positive or negative with a third category of 'it depends on…' attitudes emerging. A wide range of different factors, both extrinsic and intrinsic, have led to these attitudes; however, this thesis proposes that practitioners' beliefs regarding technology as well as more existential beliefs, such as their pedagogical beliefs in the most appropriate approach to early childhood education and their belief in the importance and value of family life, are an extremely significant determinant of attitudes towards technology.

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I would like to thank all those involved in the EdD programme at the University of Sheffield, particularly Professor Jackie Marsh for her support and guidance as I carried out this piece of research. I would also like to thank those early childhood practitioners who so willingly gave up their time to participate in my research and to share their beliefs with me. Finally, I would like to thank my husband Barry for his unwavering belief in me and his constant support as I engaged in the EdD programme.

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Chapter 1 Introduction

1.1. The Technology Debate

The debate around the impact of technology on the lives of young children is not new. Indeed, Buckingham (2000) suggests that we can trace the debate back to the early days of television and particularly to the 1950s and 1960s when television and other digital technologies were being promoted as the future of education. However, Baggaley (2010) highlights an even earlier debate regarding technology, which can be traced back to the Luddite rebellion of 1811. The Luddites were a group of workers in the British textile industry who believed that the introduction of technology into the spinning and weaving industry would lead to them losing their jobs and livelihoods, as well as undermining craftsmanship. This resulted in an uprising, where factories were ransacked and machinery destroyed. The Luddite rebellion was quickly quashed but lead to a continued scepticism, if not open suspicion, about the impact that technology might have on society.

In relation to children, and education in particular, it was many years later before the debate regarding the impact of technology came to prominence. Early evidence of this debate can be seen in the USA in the writings of Neil Postman (Postman, 1993, 1985, 1983), who proposed that technology, both in terms of television media, and later, computer technology, is placing childhood as we know it under threat. In his early works, *The Disappearance of Childhood* (1983) and *Amusing Ourselves to Death* (1985) Postman focuses on television and the negative impact it is having on society in general and on children in particular, suggesting that television is the beginning of the end of childhood. He proposes that television is blurring the boundaries between adulthood and childhood and opening adult worlds to children, which destroys their innocence. In his later work, Postman (1993) extends his arguments from television to technology more generally, positing that technology is destroying natural forms of communication, undermining morality and causing chaos in the lives of children.

Postman's ideas were further developed in the USA by academics such as Meyrowitz (1985) and Sanders (1994). Each of these academics propose slightly different arguments; however, as Buckingham (2000, p. 25) suggests, they all identify 'a singular villain of the piece: namely, the electronic media.'

In the UK, this debate has come to prominence more recently. A brief search of national newspapers shows that the topic is rarely out of the press, with headlines such as, 'Dramatic rise in screen time putting children's health at risk, WHO warns' (Pasha-Robinson, 2017), 'Tablets and smartphones damage toddlers' speech development' (Knapton, 2017) and 'Are tablet computers harming our children's ability to read?' (Dredge, 2015). In addition, authors such as Palmer (2006) and Sigman (2005) have sold millions of copies of their books, which claim that modern day childhood has been made 'toxic,' and children's lives are being 'damaged' by, among other things, modern technology.

In 2007, Dr Tanya Byron was commissioned, by the then government, to conduct a review into children's use of technology, which resulted in the 'Safer Children in a Digital World' report, which has become known as the Byron Review (Byron, 2008). In this report, Byron points out that a 'fiercely polarised debate' (p. 1) has arisen, with a wide range of very strong opinions being expressed regarding the impact of technology on children. On one side of the debate are those who believe that technology can have very many benefits for young children and, as Plowman, McPake, and Stephen (2012, p. 93) propose, 'there is potential for digital media to extend the possibilities for children's learning and to transform our expectations of what children of this age have the capacity to do.' On the other hand, there are those who feel strongly that technology has no place in an early childhood setting, and may even be significantly damaging young children. These campaigners can often be viewed as overly conservative, romanticising a past without technology or in some cases, even as stirring up moral panic (Buckingham, 2007); however, as House (2012, p. 93) argues:

> ...we take great exception to being so condescendingly and dismissively labelled. What we are "guilty" of is bringing a radical, critically reflective capacity to the breathless momentum of modern technological developments …and a passionate wish to protect what is fundamentally human from the march of the inhuman.

Even the language used by these advocates and opponents of technology indicates the strength of feeling that can exist within the debate. Indeed, in my own experience of working with both undergraduate and postgraduate students studying early childhood, the role of technology in the lives of young children, and its place in the early childhood education system, has consistently been one of the most controversial issues debated in a range of 'contemporary debates' modules on which I lecture. As a result, my interest in the very strong views expressed by many students was piqued and has been significant in my decision to conduct this piece of research.

1.2. Aims and Research Questions

The majority of my work is with students completing a master's degree in early childhood, most of whom are working in the early childhood sector, either in nursery and reception classes in primary schools or in the Private, Voluntary and Independent (PVI) early childhood sector. In addition to these masters' students, the University in which I work also provides part-time degrees at both foundation degree level and at bachelor's degree level, for early childhood practitioners, mainly in the PVI sector, who wish to study for a degree. As I worked with these students, it became clear that a wide range of different attitudes towards technology existed, and a wide range of different practices were used within their settings, with some embracing technology and using it widely, while others do not use any technology at all. Therefore, the aim of this study was to investigate the range of views that were held by early childhood practitioners regarding the use of technology with and by young children and to try to understand the various factors which has resulted in these early childhood practitioners holding such views.

As a result, two research questions were developed:

1. What views do early childhood practitioners hold regarding the use of technology with and by young children?
2. What factors have influenced the views of early childhood practitioners regarding the use of technology with and by young children?

1.3. Three Key Understandings

In order to understand this research, three key terms need to be defined; what do I mean by early childhood practitioners, what do I mean by technology and what do I mean by young children? In the United Kingdom, the Statutory Framework for the Early Years Foundation Stage (Department for Education, 2017) is the key document, setting out the requirements for the early childhood sector. This document covers the statutory requirements for children from birth to the end of the reception year of primary school, which is five years of age. Whilst there is some controversy over this, and a general recommendation from leading experts in the sector (Moyles, 2013; Nutbrown, 2012) to increase this to age seven, at present the Early Years Foundation Stage in the UK is considered to include children from birth to five years and therefore, for the purposes of this study, an early childhood practitioner describes anyone who works within this sector. This can include teachers in the maintained sector working in nursery or reception classes within primary schools and also those who work in the PVI sector with children who are considered to be part of the Early Years Foundation Stage. This can include practitioners in private day nurseries, children's centres, playgroups, crèches and also those who work as childminders in their own homes. As a result of this, even though there is again much disagreement as to what constitutes a young child, with varying definitions in the literature (Meggitt, 2007), for the purposes of this study, a young child will be defined as a child in the Early Years Foundation Stage, aged from birth to five years.

The term 'technology' is also one with many definitions as is noted by Sacasas (2014). In my reading for the literature review for this study, I noticed that many

authors assumed an understanding of the term 'technology' but never explained what they meant by it, leaving the reader to come to their own conclusion. However, in the case of this research, this would not be helpful, as the notion of informed consent is at the heart of any kind of ethical research practice (Coady, 2010). I felt that it was important to ensure that my participants understood technology in the same way as I did, in order for their participation in the study to be 'informed' and therefore in both the focus groups and interviews I used pictures of different types of technology to ensure that the participants understood technology in a broader sense than just computers. Therefore, for the purposes of this study, technology is being used to refer to what Price (2012, p. 1) describes as 'all the equipment we find ourselves surrounded with in our homes, work place and local environment.' In the case of young children, this may include, among other things, televisions, computers, smartphones, tablets, electronic toys, games consoles, programmable toys such as Bee Bots, cameras and video cameras and sound recording equipment.

1.4. Structure of the Thesis

This thesis has been structured into 6 chapters.

Chapter One contains an introduction to the debate surrounding the use of technology with and by young children and attempts to briefly trace the history of the debate.

Chapter Two presents a review of the literature surrounding the debate about the use of technology with and by young children. It uses a theory presented by Ertmer (1999) as a structure, which suggests that there are two different types of factors which affect the views of teachers regarding technology which are viewed as first and second order. Firstly, the literature on first order, extrinsic factors such as the cost of technology and the lack of training available to assist practitioners in using technology is reviewed. Secondly, the literature on second order, intrinsic factors,

which are predominantly made up of practitioners' beliefs about the nature and value of technology is discussed.

Chapter Three outlines the methodology for the study. It presents a rationale for the use of a qualitative, interpretive methodology as well as analysing the specific research methods used. This chapter concludes with a discussion of the ethical considerations inherent in the study and the analytic processes used.

Chapter Four presents the results of the study and an analysis of the findings. The data were drawn from the four focus groups and ten in-depth interviews which were carried out, and utilises a process of thematic analysis to analyse the two key themes and seven subsidiary themes.

Chapter Five uses a range of theoretical positions to discuss the findings. This chapter draws largely on the work of Ertmer (1999) in regards to first order and second order barriers to technology use, as well as to the theories of Rokeach (1968) and Nespor (1987) regarding the formation and development of beliefs.

Chapter Six concludes the thesis with some final reflections and a discussion of the implications and limitations of the study.

Chapter 2 Literature Review

2.1. Introduction

The use of technology by young children has significantly increased over the past twenty years. Technological advances have resulted in a wide range of affordable technologies being available to families and their young children (Ofcom, 2016; Arrow & Finch, 2013; Chien, 2013). Since 2003, technological equipment such as digital televisions, games consoles and laptop and desktop computers have more than doubled in their uptake among UK households and just in the past few years, the household uptake of tablet computers has more than doubled with nearly 60% of UK households now reporting owning a tablet computer (Ofcom, 2016).

As a result, young children have access to a wide range of technology, both in the home and in their early childhood setting, which has led to a 'fiercely polarised debate' on the impact that technology is having on young children (Byron, 2008, p.1). Many different factors have been posited as having an effect on how early childhood practitioners feel about the use of technology with young children in their settings; however, the first significant piece of research investigating these factors was carried out by Ertmer (1999) who proposed two types of barriers which interact to affect practitioners' attitudes towards the use of technology in their settings. Firstly, first order extrinsic barriers, such as lack of time, resources or appropriate training and professional development were proposed as having a significant impact on attitudes towards technology. Secondly, second order intrinsic barriers such as practitioners' pedagogical beliefs and the perceived value of technology for supporting learning were highlighted as being extremely influential in determining practitioners' attitudes towards technology (Ertmer, 1999). It has been agreed that extrinsic and intrinsic barriers interact to influence the attitudes of practitioners towards technology (Blackwell, Lauricella, & Wartella, 2014; Blackwell, Lauricella, Wartella, Robb, & Schomburg, 2013; Cullen & Greene, 2011; Parette, Quesenberry, & Blum, 2010); however, it has been suggested that in recent years, many extrinsic barriers no longer exist, as the cost of technology has

decreased, and both pre and in-service training on the use of technology in educational settings has significantly increased (Blackwell et al., 2014). As a result, it has been suggested that it is the second order intrinsic barriers which are more influential in determining the attitudes of early childhood practitioners towards the use of technology in their settings (Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, & Sendurur, 2012; Zhao & Frank, 2003). Indeed, Blackwell et al. (2013) suggest that first order, extrinsic issues are easier to address than second order intrinsic issues when they point out that:

> A teacher may have the knowledge of how to use a technology, which results from breaking down first-order barriers, but this does not necessarily lead a teacher to believe in the value of the technology for her teaching practices (p.311).

This review of the literature surrounding attitudes toward technology will therefore begin by briefly examining the first order, extrinsic issues which may have an impact on the attitudes of early childhood practitioners towards technology in early childhood settings. Issues such as cost, resources, time and technical support will be examined, along with issues surrounding training and professional development. This will then be followed by a more in-depth analysis of the main intrinsic issue impacting on early childhood practitioners, that of personal beliefs regarding the impact that technology is having on the lives of young children.

2.2. Extrinsic Factors Affecting Attitudes Towards Technology.

The first extrinsic factor to consider is that of cost. Goktas, Gedik and Baydas (2013) found that lack of hardware was a significant issue in primary schools, and that the key to addressing this issue is to provide greater financial resources. This is supported by Yurt and Cevher-Kalburan (2011), who point out that the funds provided for the purchase of technology in early childhood classrooms are often not sufficient. If this is the case for schools, who receive their funding from central or local government, it will be even more applicable to early childhood settings in the PVI sector, which often face significant challenges in deciding how to spend the very limited amount of funding available to them (Hill, 2013). However, it should be

noted that some researchers suggest that cost should no longer be an issue with regard to using technology in early childhood settings. All that is required is a creative approach to overcoming budget restraints. For example, Parette et al. (2010) state:

> No longer can we hide behind barriers of… a lack of fiscal resources. While these can be challenges, there are certainly ways to overcome these challenges through grant-writing, collaborations with local agencies, and donations of equipment that can turn challenges into opportunities (p.338).

Indeed, Wood, Specht, Willoughby, and Mueller (2008) found in their study that most early childhood centres were able to engage in significant fundraising in order to purchase technology for the setting.

Linked to cost is the issue of resources. Goktas et al. (2013) confirm that lack of hardware is a significant factor in determining the use of technology in schools. Wood et al. (2008) agree but point out that it is not simply lack of technological resources but a lack of general resources in the setting which make the use of technology problematic, for example, insufficient electrical outlets. In addition, Hew and Brush (2006) highlight that even in settings where technology is available, it may not be easily accessible. Several classes may share access to specific technology and therefore a 'pecking order' can arise where some classes use technology extensively and others have limited access. Hew and Brush (2006) go on to suggest that it is not simply lack of hardware that can be an issue but also lack of appropriate software. This is supported by Goktas et al. (2013) who argue that effectively designed materials are often lacking and need to be available if technology is going to be considered useful by practitioners.

A further resource issue which can impact on practitioners' attitudes to technology in early childhood settings is that of technical support. Kopcha (2012) highlights that even when technology is present in the setting, practitioners may not be able to use it as it is not working properly. Zhao and Frank (2003, p.809) concur and point out that technology is 'inherently unreliable and can break down at any time,'

and this can be frustrating for practitioners, particularly if there is no support available to fix the problem. Indeed, as a result of this, Zhao and Frank (2003) go on to suggest that many practitioners will choose not to use technology at all if no reliable technical assistance is available. This notion is supported by Wood et al. (2008) who found that technical problems and malfunctions significantly affected attitudes towards using technology among practitioners.

A further factor which can influence the attitudes of early childhood practitioners towards technology in their settings is that of time. Firstly, many practitioners feel that finding time to engage with technology during the very busy routine of an early childhood setting is difficult (Wood et al., 2008). Additionally, Kopcha (2012) suggests that many practitioners feel that supporting children to use technology, and managing their behaviour whilst they are using it, takes up too much of their time, and therefore they choose not to use technology in their settings. However, the most commonly raised time factor appears to be for practitioners finding the time to learn how to use the technology themselves before using it with the children (Chien, 2013; Goktas et al., 2013; Ertmer et al., 2012). Hew and Brush (2006) suggest that it can be very time consuming for practitioners to preview and select appropriate resources and prepare equipment for the children to use, and many do not feel they have the time to spend on such activities. Even those practitioners who already have some skill in using technology find that technology is changing so rapidly that they don't have time to keep up to date with these changes (Wolfe & Flewitt, 2010). Indeed, Inan and Lowther (2010, p.938) suggest that, 'the fast and constantly changing nature of computer technology makes it difficult for teachers to keep up with the pace set by emerging software and technologies.' Additionally, Karagiorgi (2005) points out that practitioners are rarely given any non-contact time in which to develop skills and awareness of technology. Those who wish to explore this area often have to do so in their own time, which can significantly affect their attitude towards it.

Another extrinsic factor which can impact on the attitude of early childhood practitioners towards the use of technology with the young children in their setting

is that of developing appropriate expertise. Ertmer et al. (2012) point out that, in their study, the most cited reason given by teachers for not using technology in their classrooms is lack of appropriate professional development. Goktas et al. (2013, p.218) concur and suggest that from their research 'the participants considered lack of in-service training to be the most significant barrier. In addition, most of them stated that higher quality and more quantity of in-service training should be offered.' Indeed, the issue of training seems to appear significantly in the literature (Wachira & Keengwe, 2011; Inan & Lowther, 2010; Nikolopoulou & Gialamas, 2009; Wood et al., 2008). The majority of this literature is based on research among teachers in schools, where in-service training is common place and where an annual budget is usually set aside for staff development. If this is the case among school teachers, it will be even more significant among practitioners in the PVI early childhood sector, who rarely have funds for in-service training and staff development and even when funds are available, they are predominantly used for training in areas which are considered key to the success of the nursery as a business (Jameson & Watson, 1998). Indeed, Sadek and Sadek (2009) suggest that the most important areas for staff development within a private and voluntary setting are first aid, food handling, special educational needs, behaviour management, equal opportunities, anti-discriminatory practice and child protection. In the list of suggested training requirements provided in their nursery management guide, the use of technology does not even feature, which clearly reflects the priorities of the sector.

Therefore, whilst some of these extrinsic factors may be overcome without too much difficulty, many of them may still exist in early childhood settings where resources and funds are limited and the sorts of training and development often found in the maintained sector are not available.

2.3. Intrinsic Factors Affecting Attitudes Towards Technology.

While these extrinsic factors may have an impact on the attitudes of early childhood practitioners towards the use of technology with young children, Ertmer et al. (2012) suggest that the factor which has the most significant impact on these attitudes is that of practitioner beliefs about the value and relevance of technology for young children. Ertmer (2005) points out that a significant amount of empirical evidence points towards the importance of beliefs in determining teachers' attitudes and behaviours. Indeed, Pajares (1992, p.307) suggests that 'few would argue that the beliefs teachers hold influence their perceptions and judgments, which, in turn, affect their behavior in the classroom.'

The study of beliefs and attitudes is complex (Kim & Han, 2015; Rubie-Davies, Flint, & McDonald, 2012; Pajares, 1992) and even defining what is meant by the term 'beliefs' has proven to be a contentious topic. As Pajares (1992, p. 309) suggests, beliefs:

> … travel in disguise and often under alias—attitudes, values, judgments, axioms, opinions, ideology, perceptions, conceptions, conceptual systems, preconceptions, dispositions, implicit theories, explicit theories, personal theories, internal mental processes, action strategies, rules of practice, practical principles, perspectives, repertories of understanding, and social strategy, to name but a few that can be found in the literature.

White (1999, p. 443) proposes that beliefs can be defined as 'mental constructions of experience,' which echoes notions presented by Kagan (1992) who suggested that beliefs are principles that define practice and can also be defined as a personal epistemology, perspective or orientation. Sakellariou and Rentzou (2012) highlight that beliefs are subjective and therefore vary greatly between individuals; however, substantial research into the area of teachers' beliefs suggests that whilst beliefs vary between teachers, what remains stable is that beliefs are deeply ingrained, resistant to change and strongly influence the behaviours of those who hold them (Kim & Han, 2015; White, 1999; Kagan, 1992; Pajares, 1992).

Rokeach (1968, p. 113) in his famous treatise on beliefs suggests that 'belief is any simple proposition, conscious or unconscious, inferred from what a person says or does.' He goes on to propose that there are three key ideas associated with belief. Firstly, he suggests that beliefs 'differ in intensity and power' and whilst some beliefs are extremely strong and deeply held, others may be weaker and therefore more easily changed. Secondly, Rokeach (1968, p.113) proposes that beliefs run on a 'central-peripheral' axis with some beliefs being at the heart of a person's belief system whilst others are more peripheral to the belief system. Finally, he goes on to highlight that those beliefs which are more central to a person are more resistant to change whilst those beliefs which are more peripheral, are more open to change. In terms of centrality, Rokeach (1968) also goes on to propose that the central-peripheral nature of beliefs can be affected by a number of factors. Beliefs that are bound up with a person's identity are most central whilst beliefs that are related to matters of taste and personal preference are most peripheral. However, in between are a range of beliefs that are either underived and based on personal experiences or derived from the ideas of others. Whilst underived beliefs based on personal experience are often very strong because, as Pajares (1992) suggests, seeing something with your own eyes is a strong influencer of belief, the derived beliefs gained from other people can also be resistant to change, as the sharing of beliefs with others can reinforce and strengthen them.

Pajares (1992) draws a distinction between knowledge and beliefs in educational professionals, and suggests that whilst knowledge is often based on what is learned through training, beliefs are much more value laden and are influenced by a wider range of life experiences and interactions. As a result, beliefs have an affective outcome, whilst knowledge has a cognitive outcome (Ernest, 1989). Nespor (1987), in his development of the work of Abelson (1979), suggests that there are four characteristic features of beliefs; existential presumptions, alternativity, affective and evaluative loading, and episodic structures.

Existential presumptions relate to beliefs which are profoundly personal. Rokeach (1968) proposes that these beliefs are at the core of a belief system and are so

deeply ingrained that they are not open to question. Such beliefs can develop by chance or can be brought about by either a single profound experience or by a number of smaller occurrences which build up over time to form a confirmed view. However, once this view has been formed, it is extremely resistant to change and as Pajares (1992, p. 309) proposes 'existential presumptions are perceived as immutable entities that exist beyond individual control or knowledge. People believe them because, like Mount Everest, they are there.' Nespor (1987, p. 318) points out that often, existential presumptions are considered to be related to big-picture beliefs such as in the existence of God; however, he proposes that in reality, such beliefs can also be in relation to much more 'mundane' areas such as teachers' beliefs about the nature of learning or pedagogical approaches, which have come about either as a result of their own experiences of education, or in response to a significant event in their lives.

Alternativity beliefs are made up of 'conceptualizations of ideal situations differing significantly from present realities' (Nespor, 1987, p. 319). In relation to education, teachers or practitioners may have a view of an ideal setting or a utopian view of what they would like their setting to be like, which may be similar to their own fond memories of their own school experiences or completely different to their own experiences, which they may feel were less than ideal (Pajares, 1992). Such beliefs, according to Nespor (1987) are deep rooted and not amenable to being challenged.

Affective and evaluative beliefs are largely based on feelings (Nespor, 1987) and as Pajares (1992) proposes, such beliefs are often stronger than knowledge. For example, Nespor (1987) uses the example of playing chess, and suggests that just because a person understands the rules of chess, it does not mean that they will enjoy or want to play the game. In relation to technology use with young children, practitioners may undertake training in the use of technology with young children and may understand how they can use technology, but because of their negative feelings about technology, which in turn affects their beliefs, they may choose not to use it. Indeed, as Talbot and Campbell (2014) point out, much education reform is based on the assumption that if training is provided and knowledge is enhanced,

teachers and practitioners will simply change their practice to come in line with the reform. However, Shinde and Karekatti (2012) point out that training actually has very little impact on teachers' beliefs and therefore, affective and evaluative beliefs can be difficult to change.

Beliefs may also have an episodic component. Nespor (1987) notes that many beliefs are deeply rooted in past experiences, and the strength of these experiences can strengthen beliefs and thus colour all future experiences. This is particularly noticeable within educational research, where much research into teacher beliefs has found that particular episodes or experiences in the lives of teachers and practitioners can have a significant influence on their beliefs (Kim & Han, 2015; Sakellariou & Rentzou, 2012; Calderhead & Robson, 1991; Nespor, 1987). Early life experiences can be particularly important here, as Pajares (1992, p. 317) suggests that 'early experiences strongly influence final judgments, which become theories (beliefs) highly resistant to change'. Indeed, Lortie (2002) proposes that the thousands of hours that practitioners and teachers spent in a classroom, as pupils, during their own childhood, has a much more significant impact on their beliefs about teaching than any other factor. This may be particularly pertinent in this study into early childhood practitioners' views on technology in early childhood, as for many of these practitioners, technology was not a part of their own childhood experiences as it did not exist when they were attending early childhood settings.

Pajares (1992), in the conclusion to his paper, proposes sixteen assumptions about beliefs and particularly about teachers' beliefs and their impact on practice. In a study of this size it would not be possible to examine each of these assumptions in detail but I have selected a few of these which may be particularly pertinent to this study and which may help in the later analysis on the data.

1. Beliefs are formed early and tend to self-perpetuate, persevering even against contradictions caused by reason, time, schooling, or experience.
2. Individuals develop a belief system that houses all the beliefs acquired through the process of cultural transmission.

3. Knowledge and beliefs are inextricably intertwined, but the potent affective, evaluative, and episodic nature of beliefs makes them a filter through which new phenomena are interpreted.
4. Belief substructures, such as educational beliefs, must be understood in terms of their connections not only to each other but also to other, perhaps more central, beliefs in the system.
5. Individuals' beliefs strongly affect their behaviour.

(Pajares, 1992, p. 325-326)

In the area of technology use in early childhood, practitioner beliefs fall into many categories; however, in general there are those who believe that technology is largely beneficial for young children and therefore should be integrated into early childhood settings (Plowman, McPake, & Stephen, 2010; Siraj-Blatchford, 2010; Yelland, 2010; Marsh et al., 2005) and those who believe that technology is having a damaging effect on young children's development and therefore has no place in an early childhood setting (House, 2012; Abbs et al., 2006; Cordes & Miller, 2000).

2.3.1. Belief in the Benefits of Technology for Young Children

There are many reasons why some practitioners believe that technology is beneficial for young children. Firstly, there is the belief that technology is essential for young children as it prepares them for future life. Indeed, it has been suggested that 'we live in a technological age so it follows that children need the skills, competences and enthusiasms to function and flourish in the world in which they are growing up' (Plowman, McPake, & Stephen, 2012, p.96). This idea is supported by Ntuli and Kyei-Blankson (2010) who highlight the views of teachers in their research who believe that early exposure to technology is essential. Additionally, Lindahl and Folkesson (2012, p.433) found that many preschool practitioners in their study firmly believed that the purpose of preschool education is to 'prepare children for participation in society' and therefore technology integration plays a vital part in the achievement of that goal. Indeed, Wolfe and Flewitt (2010) propose that all children need to develop their abilities using technology if they are to be able to function effectively as members of a modern society which highly values knowledge and communication. However, it should be noted that Plowman and McPake (2013) caution that while the use of technology in early childhood will help

prepare children for their future lives, technology is developing at such a rapid rate, that it is impossible to determine, with any level of confidence, what the world will look like in twenty years' time and therefore, suggesting that teaching young children about technology today will prepare them for future life and employment is impossible to support. This notion is also supported by Robinson (2010) who suggests that it is impossible to tell what the world will look like 'at the end of next week' and therefore the purpose of education should not be to focus on particular skills, which may well be obsolete in twenty years' time, but to support children to become creative individuals who have the ability to adapt, think independently and develop creative approaches to living in the world in which they will find themselves.

Another belief held by many early childhood practitioners is that technology is beneficial for motivating and engaging children (Kaye, 2017; Lindahl & Folkesson, 2012; Ntuli & Kyei-Blankson, 2010; Ottenbreit-Leftwich, Glazewski, Newby, & Ertmer, 2010). Lindahl and Folkesson (2012) propose that technology use with children as young as two years of age can be justified because it engages them for longer periods of time than would be possible using traditional approaches, and therefore allows planned activities to be extended. Indeed, Plowman et al. (2012) suggest that technology can have many motivational benefits for young children such as developing the disposition to learn, allowing self-directed learning, increasing self-esteem and confidence and encouraging persistence. Additionally, Ottenbreit-Leftwich et al. (2010) propose that not only does technology engage children in learning activities, but this increased engagement leads to higher quality work and therefore increased academic success. However, it should be noted that the use of technology does not always lead to increased engagement and achievement. Plowman and McPake (2013, p.30) point out that many computer programmes and products available for young children:

> … are often based on mundane educational tasks disguised as entertainment. The so-called interactivity may well provide some initial motivation for learning, but it rarely continues beyond the first few encounters and may even get in the way of the educational potential.

Therefore, it could be that some poorly designed and conceptualised technological resources for young children may actually decrease children's interest and engagement with the topic.

As well as the belief in the motivational benefits of technology and in the ability of technology to prepare young children for their future lives, many practitioners who hold positive views on the benefits of technology for young children believe that technology can promote academic achievement (Yurt & Cevher-Kalburan, 2011; Ottenbreit-Leftwich et al., 2010; Nir-Gal & Klein, 2004; Xiaoming & Atkins, 2004). Indeed, Ottenbreit-Leftwich et al. (2010) found that many of the practitioners in their study believed that technology could be used to help children to learn something that they could not learn in any other way, by providing access to different information, resources and experiences. This is supported by Ntuli and Kyei-Blankson (2010) who suggest that technology offers young children unique opportunities which are not possible to provide in the natural world. Additionally, Yurt and Cevher-Kalburan (2011) suggest that technology can provide unique opportunities for young children to develop problem-solving skills through active learning. However, it should be noted that not all technology can be seen in this beneficial way. Blackwell et al. (2014, p.83) suggest that it is 'quality' educational media which can promote young children's learning through technology, an idea supported by Plowman and McPake (2013, p.30) who highlight that 'technological interactivity does not guarantee an educational encounter' and point out that many technological products available for young children today hold little educational potential. Indeed, the use of technology itself does not guarantee that young children will learn anything from the experience unless the products are developmentally appropriate and they are used in a pedagogically appropriate way (Nikolopoulou & Gialamas, 2009; Watson & Hempenstall, 2008; Siraj-Blatchford & Siraj-Blatchford, 2006).

One specific area in which many practitioners believe technology can support academic achievement is the area of literacy. Marsh (2005) suggests that teachers need to broaden their understanding of literacy and embrace technology as having

many benefits for children's literacy development. This notion is supported by Andrews (2003) who points out the reciprocal relationship that exists between technology and literacy and highlights the significant benefits which can be gained from using technology to support literacy development. Indeed, using technology has been found to increase young children's motivation to read, to enliven traditional literacy practices and to increase phonetic awareness (Kaye, 2017; Wolfe & Flewitt, 2010; Jennings, Hooker, & Linebarger, 2009; Levy, 2009). The emphasis in early childhood literacy development is on phonetic awareness and linking sounds and letters (Department for Education (DfE), 2017) and while no mention of technology is made in the literacy section within the Statutory Framework for the Early Years Foundation Stage (DfE, 2017), many practitioners believe that technology can play an important role in supporting young children to develop phonetic awareness (Huffstetter, King, Onwuegbuzie, Schneider, & Powell-Smith, 2010; Comaskey, Abrami, & Savage, 2009; Watson & Hempenstall, 2008). In addition to supporting the reading element of literacy, many practitioners believe that technology can also support the development of emergent writing in young children (Arndt, 2016; McLean, 2013; Burnett, 2010; Hill, 2010). Burnett (2010) suggests that technology can support writing in early childhood settings by acting as a stimulus and providing ideas for writing activities. Voogt and McKenney (2007) agree, and suggest that technology can also be useful for vocabulary building, developing self-expression, and understanding writing for different purposes and audiences.

As well as developing reading and writing skills, many practitioners believe that technology can be used to support oral language development. Burnett (2010) points out that in her research it was clear that when young children used technology together, a great deal of discourse took place, which in turn supports the development of oral language skills. This is supported by Hyun and Davis (2005) who found that when the children in their study were using technology, they were thinking, talking and questioning in a purposeful way, which developed over time into significant exploratory talk. Huffstetter et al. (2010) go further and suggest that even when children are using technology on their own, programmes which

encourage children to speak out loud can significantly improve young children's oral language.

Whilst some believe that technology is beneficial in supporting the literacy development of all children, Marsh et al. (2005) suggest that the most significant benefits could be for children who find traditional literacy problematic. They suggest:

> The emergence of new forms of text, new access to information and the shifting importance of print within them may just open the door enough for indigenous, migrant, ESL, poor and rural/remote students – those who have traditionally struggled around traditional print-based literacies - to find a voice and the capacity to transform their textual and social landscapes (Marsh et al., 2005, p.25).

Similar proposals have been made by Andrews (2003) who found that technology used to support literacy development can be particularly beneficial for children with special educational needs, and studies by Moody, Justice, and Cabell (2010) and by Watson and Hempenstall (2008) both found that technology could be used effectively to support children at risk of reading failure. Indeed, Wolfe and Flewitt (2010) go further and suggest that for these children, technology does not just support literacy but can support learning in all areas, as it offers children elements of control and choice which are often unavailable to them through more traditional activities.

However, Plowman and McPake (2013) caution that simply using technology does not necessarily lead to improved literacy. Indeed, they warn:

> Technological interactivity is meagre compared to human interaction: existing technology cannot adapt itself to an early reader in the same way as a more capable partner sharing a reading experience can. An electronic book that reads the words out one at a time or asks children to point to a picture with the stylus and then says "well done" cannot simulate the experience of adult-child conversations. (p.30).

A final belief held by many practitioners who support the use of technology in early childhood settings is that technology can be beneficial in bridging the gap between home and the setting. Children do not live compartmentalised lives, rather, they live in whole cultures and bring aspects of this culture to bear in every aspect of their lives (Mackey, 2004). Before arriving in an early childhood setting, young children already have many 'funds of knowledge' (Moll, Amanti, Neff, & Gonzalez, 1992) and it is important for practitioners to draw on these if they are to engage young children in the activities and culture of the setting (McLean, 2013; Burnett, 2010; Hill, 2010; Levy, 2008).

A significant part of the home life of many young children is related to the use of technology, with young children having access to a wide range of technological equipment (Slutsky & DeShetler, 2017; Ofcom, 2016). Additionally, Parízková & Hills (2005) suggest that engaging with technological equipment takes up the second largest part of a child's day, second only to sleeping, therefore if practitioners ignore this significant area of children's lives, they risk alienating them and cutting them off from what really matters to them (McLean, 2013). Indeed, Pompe (1996, p.118) goes so far as to suggest that 'if we don't want to be left with children whose hearts and minds have taken the exit door, we need to let them guide us to the kinds of places where they feel involved, clever and alert.' Third space theory (Bhabha, 1994) has been used to try to help explain the ways in which the first space of children's homes and the second space of the educational setting in which they are placed can be brought together into a third space where children can begin to make sense of what they are learning (Moje et al., 2004). Levy (2008) found in her study that technology can create an important third space where children can make links between their home experiences and what they are learning in the setting in a very meaningful and non-threatening way. Indeed, McLean (2013, p.36) proposes that 'teaching and learning in the early years must build on children's experiences with technologies in ways that enable connections within, and across, the communities of learning children engage in.'

2.3.2. Belief in the Negative Impact of Technology on Young Children

While many practitioners in early childhood settings view technology as having great benefits for young children, there are also many practitioners who feel that technology is having a negative impact on young children. The beliefs of these practitioners can be seen in four main categories: the belief that technology is having a negative impact on young children's physical development and health, social and emotional development, cognitive development and moral development.

2.3.2.1. Physical Development and Health

Many early childhood practitioners believe that technology is having a negative impact on young children's physical development and health. The most recent results from the National Child Measurement Programme (Health and Social Care Information Centre [HSCIC], 2016) indicate that 22.1 percent of children in reception classes in England are either overweight or obese. Additionally, the rate of acceleration in childhood obesity is outstripping that anticipated. In a study carried out in 2008 and published in 2010 which predicted obesity levels up to 2015, it was anticipated that by 2015 obesity levels among young children in England would have risen to 10.1% in boys and 8.9% in girls, figures which were exceeded much earlier than expected (Stamatakis, Zaninotto, Falaschetti, Mindell, & Head, 2010). The causes of obesity in childhood are complex (Jenvey, 2007); however the HSCIC (2010) point out that there are definite links between a sedentary lifestyle and childhood obesity, much of which they attribute to children's use of technology. Indeed, they point out that on average, on a weekday, young children spend 3.4 hours using these technologies, rising to an average of 4 hours per day at the weekend. For some children, however, the time spent on using these technologies is much greater, indeed, it has been suggested that engaging with technology, particularly television and games consoles, takes up the second largest amount of time in a young child's day, second only to sleeping (Parízková & Hills, 2005) which indicates that these sedentary technological activities are particularly significant in the lives of young children. The link between sedentary lifestyles and obesity has been highlighted in a wide range of literature. Landhuis, Poulton,

Welch, and Hancox (2008) found that not only did engaging with technology for a few hours each day (2.3 hours) have a strong link with childhood obesity levels, but because 'lifelong patterns of body mass and physical fitness are established during childhood' (p.1459), this use of technology in early childhood increases the likelihood of long term obesity in adulthood, far beyond the impact of technology use in adulthood alone. These findings are concurrent with the findings of Reilly (2008) who suggests that 'obesogenic growth trajectories' (p.322) are established in the preschool years, and as levels of sedentary behaviour among preschool children are generally high, this can have long term health implications. Much of the research is related to the sedentary nature of television viewing (Zhang, Wu, Zhou, Lu, & Mao, 2016; Reilly, 2008; Jouret et al., 2007); however, it could be argued that many forms of technology use encourage sedentary behaviour, particularly those associated with screen time such as computer games and games consoles, and therefore may result in childhood obesity and related health issues in young children.

Findings such as these, which show a long term negative impact of technology use on health, can contribute to practitioners' beliefs in the negative impact of technology on young children, particularly when the research suggests that even a short amount of daily use can be significant. Indeed, Lumeng et al. (2006) found that even engaging with technology for two hours a day could increase the chances of a child becoming obese, and Brown, Nicholson, Broom, and Bittman (2011) found that this duration is even lower, suggesting that as little as ninety minutes of sedentary screen based activity daily is enough to significantly increase the likelihood of developing childhood obesity. This is less than half of the time that the HSCIC (2010) suggest young children in the UK are actually spending on sedentary activities, which may result in concerns among early childhood practitioners about the use of screen based technologies.

In addition to the link between sedentary activity and childhood obesity, research suggests that it is not simply the sedentary nature of the activity which is causing increases in obesity levels, but also the prevalence of young children snacking on

junk food and energy dense snacks whilst they engage in sedentary screen-based activities. Brown et al. (2011) found that a number of different lifestyle factors, all centred around television viewing, had a significant impact on the development of childhood obesity; however of particular note was the fact that time spent watching television was linked to increased snacking by young children and that 'foods eaten in association with television viewing may influence weight more than the balance of active and inactive pursuits' (p.224).

However, it should be noted that not all research supports this position. Jenvey (2007) highlights the fact that obesity is a complex topic, and determining the causes of obesity is not a simple task. She goes on to suggest that pinning the blame for childhood obesity on one sole cause is unlikely to be accurate and she questions the methodologies used in many studies which link television viewing and obesity. In her own study of young children's activity levels, Jenvey (2007) found that whilst the children did spend a significant amount of time engaged in sedentary activities such as television viewing, a large proportion of the children were also engaged in a wide range of physical activities such as organised sports, which could counteract the effects of the sedentary activity. Similar findings are presented by Plowman et al. (2010) who suggest that the parents in their study were very aware of the need for young children to be active and therefore took sensible precautions to limit the length of time their children were allowed to engage in sedentary activities and also to promote a balance of indoor and outdoor, sedentary and active activities.

Other research scrutinises the relationship between the use of technology and obesity from an alternative perspective. It has been suggested that it is not simply the sedentary nature of many technological activities which can result in obesity but the actual content of what children see as they engage with these devices. Anderson and Anderson (2010, p.1334) suggest that many television programmes aimed specifically at young children actually promote the eating of unhealthy foods. They use the example of the popular children's television character 'Barney' and state that 'the prevalence of high-fat, high-sugar foods on television, coupled with

the positive reinforcement that most characters receive for eating such foods, may be contributing to eating patterns in children that are associated with obesity.' These findings are supported by Veerman, Van Beeck, Barendregt, and Mackenbach (2009) who go on to suggest that the advertising of energy dense junk foods on television may be partly to blame for the increase in childhood obesity. They propose that if there was a complete ban on television advertising of junk foods, as many as one in three children in the United States of America would not have been obese and many more overweight children would be a normal weight.

Some might argue that these findings are irrelevant in the United Kingdom as the advertising of foods high in fat, salt and sugar is banned during children's programming. However, as seen in Sixsmith and Furnham (2010), a great deal of unhealthy food is advertised during daytime and evening programming, and as the television is often on in the background, young children will be exposed to a great deal of food advertising during programming which is not aimed at them but which they are aware of nonetheless. In addition, Cowburn and Boxer (2007) point out that with the introduction of stricter rules on advertising foods on television, many companies are turning to the internet as a means of targeting children with their advertisements. They go on to highlight that many of the same 'marketing tricks' (p.1024) that were once used on television are now being applied to advertising on websites.

This notion is also discussed by Buckingham (2000, p.148) who points out that commercially based websites aimed at children are now abundant and attempt to combine 'superficially educational activities with advertising messages' and goes on to suggest that the lines are continually being blurred between content and advertising. This notion is supported by Ali, Blades, Oates, and Blumberg (2009) who point out that in their research, very few young children were able to distinguish between content and advertisements on a web page which could lead them to be more susceptible to the advertising messages portrayed. Indeed, this has now become such a prominent issue that The Committees of Advertising Practice (2016) have recently announced that from the 1st July 2017, the advertising

of high fat, salt or sugar (HFSS) food or drink products in all children's media will be banned. This includes in print, at the cinema, online and in all social media, bringing it in line with the current regulations for television.

As well as the issue of childhood obesity, many early childhood practitioners believe that technology is detrimental to young children's physical development and health because it can lead to physical harm. Gillespie (2002) points out that young children's bodies are still developing and therefore they are more at risk of developing musculoskeletal disorders as a result of bad posture when using computers and games consoles. She goes on to highlight that several analyses of classroom ergonomics, in respect to the use of computers, indicate that concern is warranted, especially for young children, where appropriately sized physical equipment is often not provided to enable computers to be used safely. These findings resonate with those of Breen, Pyper, Rusk, and Dockrell (2007) who found in their study that the classrooms examined were often equipped with unsuitable and non-adjustable furniture which in turn resulted in bad posture from many of the children as they used the computer. They go on to highlight that even when using the computer for short periods of time, poor posture can develop in young children which can lead to musculoskeletal problems.

As well as musculoskeletal problems, a range of literature also highlights other physical problems which can arise from technology use. Gillespie (2002) indicates that physical problems can include repetitive strain injuries, eye strain, tendonitis, carpel tunnel syndrome and back and neck pain. There appears to be very little research in the UK on this topic; however, in the USA conditions such as 'Blackberry thumb,' 'Nintendonitis' and 'Wi-itis' have been identified. Rubin (2010) describes a number of cases of what he calls 'wii-itis' which link to the use of the Nintendo Wii games console. He points out that many of the sports based games on the Nintendo Wii involve the use of one arm with either a throwing or swinging motion. These motions, without proper training, can lead to a range of arm and shoulder problems in young children. Sparks, Chase, and Coughlin (2009) concur and point out that the Nintendo Wii console appears to have a more significant rate of injury

than other games consoles due to the physical nature of the interface. However, they also highlight that injury is not restricted to the Nintendo Wii and point out that other games consoles can also incur a range of physical injuries.

A further physical and health issue which may affect attitudes towards technology is the proposed link between the use of technology and disrupted sleep patterns in children. Taki and Kawashima (2012) highlight the important role that sleep plays in brain development in early childhood and suggest that not getting enough sleep can play a significant, detrimental role in the development of grey matter. Cespedes et al. (2014) also point out the great importance of sleep for young children but report that in their research, television viewing had a significantly negative effect on young children's sleep patterns, particularly those of boys and children from ethnic minorities. They go on to highlight that this negative impact became even clearer for children who had a television in their bedrooms. This study highlights the negative impact on sleep of watching television in the evening as it may displace the time when children would normally be asleep. This notion is supported by Garrison, Liekweg, and Christakis (2011); however, they go on to highlight that in their research, daytime use of digital media also had a negative impact on sleep patterns in children if the media was of a violent nature. This coincides with the findings of Cain and Gradisar (2010) who also suggest that it is not simply the fact that electronic media use displaces sleep but that it also causes increased mental, emotional and physiological arousal which prevents the onset of sleep as well as the brightness from the screen interrupting the natural circadian rhythms of the body, delaying sleep. As well as examining the impact of television viewing on sleep patterns, the study by Cain and Gradisar (2010) also highlights the negative impact on sleep of electronic games and computers. However, it should be noted that the majority of studies examining the negative impact of digital media on sleep are based on the prolonged or excessive use of technology, not on the types of use often associated with early childhood settings.

2.3.2.2. Social and Emotional Development

As well as a belief in the negative impact of technology on physical development and health, many practitioners believe that technology is having a negative impact on young children's social and emotional development. Abbs et al. (2006) propose that what young children really need is 'regular interaction with the real-life significant adults in their lives'; however, the growing use of technology today is taking children away from this much-needed social interaction and immersing them in a solitary screen based world. This idea is supported by the Alliance for Childhood (2004), who point out that by allowing young children to become immersed in digital technologies, the opportunities for social interaction are restricted, which has a negative impact on social development. Ofcom (2008) highlight that a growing number of young children have access to a wide range of technologies in their bedrooms. They indicate that over 40 percent of children under the age of seven have a games console in their bedrooms with a larger percentage having their own television and a small, but growing proportion having their own PC with internet access. This corresponds with the findings of Livingstone (2002) who comments that whilst in the past, technological equipment in children's bedrooms was mainly reserved for teenagers and older children, more and more young children today have their own technological devices in their own bedroom for their own personal use. The result of young children having these technologies in their bedrooms is that at home, the majority of technology use is of a solitary nature with only very occasional involvement of another person, which can result in the development of poor social skills (Mistry, Minkovitz, Strobino, & Borzekowski, 2007; Kerawalla & Crook, 2002).

It should be noted however, that Kerawalla and Crook (2002) also found that unlike the home environment, when technology was used in the setting, it was used predominantly in a collaborative, not solitary way, a finding echoed by Lim (2013, p.1) who suggests that 'when technology integration is accomplished successfully in early childhood education settings, children tend to interact more with one another.' However, the nature of this interaction needs to be considered, and

Plowman, Stephen, and McPake (2008) suggest that in their research, working at a computer with another adult or child did not guarantee a social experience as many of the children were so focused on the computer screen that interaction was limited.

A further social and emotional reason why many early childhood practitioners believe in the negative impact of technology on young children's development is because technology has been suggested to be a major contributing factor in the disintegration of family life. Kubey and Csikszentmihalyi (1990, p.108) point out that 'television seems to have changed the ways in which family interaction occurs. When the set is on, there is less conversation and less interaction.' This notion is supported by Bruni and Stanca (2008) who suggest that television viewing is having a profound effect on relationships within the family. They point out that time spent watching television detracts from time which would previously have been spent talking to other family members and interacting socially. Bruni and Stanca (2008) go on to highlight that these 'relational activities' (p.510) are extremely important in determining life satisfaction and if they are neglected due to the solitary nature of television viewing, there will be negative social and emotional consequences.

As well as examining how technology influences family relationships, Bruni and Stanca (2008) also highlight how technology can have a negative impact on children's emotional development and particularly on their happiness. They point out:

> Television is one of the main agents of socialization and, through advertising and program contents, plays a key role in defining what our goals should be. In particular, television is a key factor in producing the belief that happiness depends on material consumption and in raising our material aspirations (p. 8).

Bruni and Stanca (2008) go on to suggest that through exposure to television, children can become dissatisfied with who they are and what they have, which can result in a lowering of self-esteem. This is supported by Frey, Benesch, and Stutzer (2007) who point out that television viewing can have a significantly negative effect

on young children's social and emotional development by lowering their life satisfaction, which can result in increased anxiety and unhappiness. In addition to anxiety, Hamer, Stamatakis, and Mishra (2009) found that escalating levels of time spent watching television, combined with the resulting low physical activity levels, resulted in negative consequences for young children's mental health and could even be seen as causing psychological distress.

A further implication of technology for social and emotional development is the link between the content of what children view in electronic media and body image in young girls. Dohnt and Tiggemann (2006) explored the body image of young girls between the ages of five and eight years and found that television viewing has led to an appearance culture where girls as young as six years wanted to be thinner than they were, even when their current weight was low for their age and height. They point out that the majority of programming specifically directed towards this age group is generally benign with regards to body image; however, the young girls in their study were regularly watching television programmes and engaging with other media which was aimed at a much older market, often alongside their parents or older siblings, and this exposure was found to result in an undue concern about their appearance. These findings resonate with those of Harrison and Hefner (2006) who point out that it should not be surprising that exposure to such media has a negative impact on the body image of young girls considering the frequency of which thinness is praised and fatness ridiculed in the media, and they go on to discuss their findings that such ideals regarding body image can lead to disordered eating among preadolescent girls.

However, it should be noted that not all research supports this perspective. Hayes and TantIeff-Dunn (2010) carried out their research with young girls between the ages of three and six years and found that although nearly half of the children in the study were concerned about being fat, there was no definitive link between these concerns and media exposure. Therefore, it would seem that for young children, particularly those in early childhood, it is not until the age of six years that body image becomes a concern.

An additional social and emotional concern raised by those who believe that technology is having a negative effect on young children is that much of the content of what children see on television, on the internet and in computer games reinforces traditional gender and racial stereotypes. Research by Bolliger (2008) found that many media advertisements included subtle stereotypes which portrayed males as being more powerful and successful than females. Additionally, when women were portrayed the body image was usually attractive and thin and when males were portrayed the image was attractive and fit which could influence young children's perceptions of themselves in a negative way. Similar findings are discussed by Götz et al. (2008) who examined stereotypes in children's television in a number of different countries. They concluded that male characters dominate television programmes aimed at young children and that almost three quarters of all main characters are Caucasian. Indeed, they point out that the ethnic diversity in the majority of the countries in the study was not reflected in the television programming aimed at young children. Additionally, the thin female idea was also reinforced with an almost complete absence of any female character who did not fit the thin blonde ideal.

Gender role stereotypes have also been found to be dominant in media aimed at young children. Nathanson, Wilson, McGee, and Sebastian (2002) highlight that young children are especially vulnerable to acquiring gender role stereotypes from the media as they may lack real world experiences. For many such children, the world of the television teaches them more about society than they learn from real life experiences. Scharrer, Kim, Lin, and Liu (2006) carried out a content analysis of 477 television advertisements and found that women are frequently portrayed in maternal roles or carrying out domestic tasks. On the few occasions when men were showing doing such tasks, it was usually in a way which highlighted their incompetence or was intentionally designed to be funny, which could have a significant negative impact on the attitudes of young children.

However, it should be noted that more current studies have suggested that there has been an improvement in the ways in which women are portrayed in the media,

but this is not the case with the portrayals of men. Gentry and Harrison (2010, p.90) state that 'while women are being shown in less stereotypically traditional roles, male portrayals still reflect a very traditional masculine perspective.' It should also be noted that it is problematic to apportion blame for stereotypic attitudes in children on the media, for as Ruble, Martin, and Berenbaum (2006) propose, it may be that children who already hold these views are attracted to media which aligns with their beliefs.

Many of these findings relate specifically to gender stereotyping on television; however, research has also found similar results associated with computer games where 'there is great concern about the ways that females are portrayed in video games and the effect that these portrayals can have on young girls' self-image as well as boys' expectations of and attitudes towards females' (Glaubke, Miller, Parker, & Espejo, 2001, p.10).

2.3.2.3. Cognitive Development

As well as concerns over physical development and health and social and emotional development, many practitioners who believe that technology is having a negative impact on young children also have concerns about the impact of technology on cognitive development. Early childhood is a critical time for the development of the young child's brain. Howard-Jones (2011, p.5) proposes that 'the developing brain of a child is more plastic, and responds more malleably to experience than an adult's brain.' This is supported by Healy (1998) who goes on to suggest that in early childhood particularly, young children's brains are in a critical period of development and require play, talk, socialising and imagining for optimum development. Page, Clare, and Nutbrown (2013) also highlight the importance of play and secure social relationships for the development of young children. However, Healy (1998) points out that during this busy time for brain development in young children, introducing and using technology can detract from those activities which are known to best foster cognitive development. Indeed, all that technology is doing is diverting children from making sense of the world around

them and developing close bonds with the important adults in their lives in the ways that we know are vital for their cognitive development. This notion is also presented by Duhaney and Duhaney (2008) who suggest that for those who believe that technology is having a negative impact on cognitive development, the primary reason is that technology does not match the active learning styles of preschool children.

While it has been suggested that technology can be used to accelerate cognitive development in young children (Arndt, 2016; Yurt & Cevher-Kalburan, 2011; Ntuli & Kyei-Blankson, 2010), this is not universally accepted. Indeed, Healy (1998) suggests that those people who feel that technology could be used to accelerate cognitive development in young children may find their attempts back-firing on them as children need strong concrete foundations before they can move on to the more abstract thought patterns required in the use of technology. This can also be seen in Bruner's modes of representation (Bruner, 1966) where he proposes that children must move through an enactive and iconic cycle of understanding before they can move into the symbolic mode used by most computer programmes. This attempt to accelerate learning is what House (2011) refers to as 'too much too soon' and suggests can actually have a detrimental effect on early learning. Indeed, it has been proposed:

> An uncritical and often unwitting ideology routinely dominates the field of children's early adult-derived ("educational") learning, with the quite unwarranted assumption being made that "earlier is better" ... and that it somehow confers a developmental advantage upon young children if they learn certain things at the earliest "deliverable" age. Not only is there no evidence for such a view, but all of the evidence points to quite the opposite conclusion - that is, that if children are coaxed or led into learning that is developmentally inappropriate for their age, then major harm can be done in the long run. (House, 2012, p.106).

Children may enjoy the use of technology and find it engaging; however, Healy (1998) questions what they are actually learning from the experience, indeed, she points out that the novelty of technology can, in itself, divert children's brains away

from important developmental tasks. These suggestions are supported by Zimmerman and Christakis (2005) who found that in their research on the impact of television viewing on cognitive development, that there was a negative relationship between television viewing before the age 3 years and cognitive development at ages 6 and 7 years. They suggest that this may be a result of television viewing displacing time which could be more usefully spent on activities which are known to support cognitive development, such as free imaginative play, an idea also proposed by Courage, Bakhtiar, Fitzpatrick, Kenny, and Brandeau (2015). Alternatively, it may be because the content of what young children watch on television is poor and does not promote age appropriate learning. However, Zimmerman and Christakis (2005) go on to suggest that the detrimental effects of television may not simply be a result of the content of what children view but it may be as a result of the medium of television itself, with its fast scene changes and singular point of focus. Indeed, this notion is supported by House (2012) who, whilst affirming the research which suggests that the content of technologies are damaging to young children, goes on to 'make the much stronger claim that these technologies themselves are *intrinsically* inappropriate for, and harmful to, young children' (p.106).

A further cognitive concern raised by those who believe that technology is inappropriate for young children is that it hinders early language development. Vygotsky (1986) has contributed greatly to the understanding that language develops as a result of social interactions, indeed, the social context in which the child lives has been suggested to be the most crucial factor in oral language development (Honig, 2007; Hoff, 2006). However, as technology use is primarily solitary, it has been suggested that it limits children's verbal interactions and hinders language development. In their research with children from 2-48 months, Christakis et al. (2009) found that for every hour of television watched by young children, their verbalisations decreased significantly and they go on to suggest that this may explain the link between delays in language development and television viewing by young children. Courage, Murphy, Goulding, and Setliff (2010) propose that the link between television viewing and development issues is much more

subtle that this. They found in their research with six and eighteen month old children, that children of this age did not pay a significant amount of attention to the television when it was on, preferring to play with toys. This would suggest that television itself has little impact on children of this age; however, in relation to social interaction, when the television was on, they found that parents communicated less with their infants, which may have a negative impact on their language development. Schmidt, Pempek, Kirkorian, Lund, and Anderson (2008) propose that background television can have a significant negative impact on young children, as in their research with twelve, twenty-four and thirty-six month old children, they found that when the television was on in the background there was a significant reduction in the focused attention of the young children to the toys they were playing with at the time as well as a decrease in the mothers' verbal interactions with the children, which may impact on language development.

However, it should be noted that much research has concluded that it is not the technology itself that impacts on language development but the content of what young children see on television that can either support language development or have a detrimental effect on it (Courage & Howe, 2010). For example, Linebarger (2006) proposes that while commercial entertainment programming can have a negative impact on vocabulary development, 'children who watched educational television showed gains in their generalized listening vocabulary' (p.11). Viewing programmes such as *'Dora the Explorer'* and *'Arthur,'* which have a specific educational emphasis, was related to greater vocabularies and higher expressive language scores in children; however, viewing other children's entertainment programmes such as *'Teletubbies'* and '*Barney*' were related to poorer vocabularies (Linebarger & Walker, 2005). These findings are also supported by Rice, Huston, Truglio, and Wright (1990) who found that in their study on the impact of the children's television programme 'Sesame Street', young children who watched the programme had greater vocabulary development and learned more new words daily. Indeed, Anderson and Hanson (2009) use the analogy of diet and propose that in the same way that the types of food which people eat determine their physical health outcome, it is the types of programmes that children watch on

television which will determine whether they are either beneficial or detrimental to development.

In addition to these cognitive concerns, those who believe that technology is not beneficial to young children also suggest that technology has a negative effect on the development of imagination and creativity. Cordes and Miller (2000) state:

> Children who are exposed to a heavy electronic diet of television, the Internet, video games, and multimedia are bombarded with ready-made images, often cleverly animated and quickly swapped with a point and a click, literally leaving nothing to the imagination. Entertained constantly and effortlessly by so many adult-generated images, children seem to be finding it harder to generate their own images and ideas (p. 38).

Indeed, Healy (1998) proposes that technology use results in young children who no longer know how to pretend and play symbolically, an idea supported by Singer and Singer (2005), who suggest that modern technology leaves nothing to the imagination and therefore hinders the development of creativity and imagination in young children.

However, other research contradicts these findings and suggests that it is not the technology itself which is stifling creativity and imagination but it is the unimaginative use of it by children and practitioners that can lead to these concerns (Abbott, Lachs, & Williams, 2001). Indeed, much research suggests that if technology is used in creative ways with young children it can enhance their own creativity, for example, by supporting children's ideas for creative writing (Marsh, 2010a; Bearne & Wolstencroft, 2005), by bringing new ideas to fantasy and role play activities (Edwards, 2016; Palaiologou, 2016; Marsh, 2002) and by developing creative media such as still and moving images (O'Mara & Laidlaw, 2010). McPake, Plowman, and Stephen (2013), in their research with preschool children, point out that young children can use technology in very creative way. They highlight children who were using technology to support role play, singing and music-making as well as using creative technologies such as digital cameras to develop their

understanding of the world. Therefore, as Abbott et al. (2001, p.483) propose, 'there are certainly ways of working with ICT where students can be passive in the process' and which can stifle imagination and creativity; however, there are also many ways in which technology can support the active development of imagination and creativity in ways previously not available.

While previous research discussed earlier in this review highlights how technology can be used to support literacy development, many practitioners who believe that technology is detrimental to young children's cognitive development suggest that technology can also hinder literacy. Sanders (1994) suggests that technology may be partly to blame for the rise in illiteracy among children, as children who become used to the fast paced and exciting world of technology can lose interest in the culture of books and in traditional literacy experiences, where the format of the print book can appear boring and unexciting. A poll carried out in 2003 by Ipsos-Mori also found similar results, with nearly three quarters of the children in the survey claiming to prefer watching TV or engaging with other technology rather than reading a book, and over half suggesting that they would use the internet to find information about something rather than looking in a book (Ipsos-Mori, 2003).

Research into young children's literacy development shows that in the very early years of childhood, reading storybooks and picture books with children can support language development as well as promote positive attitudes to literacy (Neaum, 2012; White, 2012; Whitehead, 2010). However, bedtime, one of the key times of the day when stories were traditionally told or read to children, is now taken up with television viewing, computer games consoles and other technologies instead, which can result in fewer shared stories leading to fewer opportunities for language development and developing a love for books (Corbett, 2010). Similar ideas are also presented in research for the Teaching Times (2013), which found that nearly half of the parents surveyed suggested that television and other technologies often got in the way of reading bedtime stories, with only thirteen percent of parents reading to their young children on a daily basis.

2.3.2.4. Moral Concerns

As well as physical, social and emotional and cognitive concerns, many practitioners who believe that technology is detrimental to young children have a number of moral concerns regarding the use of technology with this age group. Postman (1983) describes television as a 'total disclosure medium' (p.81), which opens secret worlds to children, worlds which were once the private domain of adults. Indeed, Meyrowitz (1985) proposes that 'the widespread use of television is equivalent to a broad social decision to allow young children to be present at wars and funerals, courtships and seductions, criminal plots and cocktail parties' (p.242). This can be seen in more recent research by Marsh and Bishop (2012) who describe a group of primary school age children playing 'Jeremy Kyle', a television show covering themes such as 'sexual infidelity, criminal misdemeanours, drug addiction and physical, emotional, sexual abuse' (p.18). Marsh and Bishop (2012) conclude that through watching such television shows and acting them out, children are beginning to make sense of the world in which they live and can use these experiences to 'engage in reflection on serious issues which affect society' (p.27). However, not everyone would agree with this. Some might suggest that as the content of such shows is usually either obscene or salacious (Epstein & Steinberg, 2003), allowing children access to such viewing, which is usually during the daytime, is morally wrong and is exposing children to themes which they should be protected from in childhood.

In addition, exposure to what might be considered inappropriate material for young children is not restricted to the television. For example, Valcke, Schellens, Van Keer, and Gerarts (2007) point out that children who use the internet may also be exposed to inappropriate material such as pornography. Indeed, in their study they report that a large proportion of the primary school aged children in their study in Belgium had come across material online which shocked them. This finding is also reflected in the Byron Review (Byron, 2008) where it was reported that 12% of children aged between five and seven years had come across harmful or

inappropriate content on the internet in the previous six months, which can result in high levels of concern among early childhood practitioners.

As well as moral concerns about the content of what children view on television or online, there are also concerns about children using technology to make contact with people who may intend to harm them. Findings from O'Connell, Price, and Barrow (2004) indicate that sixty percent of the children in their study were not aware that people on the internet may not be who they say they are, and an increasing number of primary age children reported arranging face-to-face meetings with people they had met on the internet. Whilst a number of these children took a parent with them to the meeting, the vast majority either went alone or with a same age peer, and many reported that the meeting had not been what they expected, with several reporting that the person they met had been verbally abusive. The dangers presented by children meeting strangers online may affect the attitudes of practitioners towards allowing them to access the internet at all.

In addition to arranging face to face meetings via the internet, Bullen and Harré (2000) propose that another danger of using the internet is that many children can be persuaded to give out personal information, which could lead to them being in danger. Indeed, O'Connell et al. (2004) found that the sorts of personal information being given out by children online included first and last names, email addresses, telephone numbers, home addresses and personal photographs. They indicate that while their research suggests there has been a slight decrease in the numbers of children giving out this type of personal information, there is still a significant number of children who will give this information out in chat rooms and other online environments. However, Livingstone (2009) points out that the threats for very young children when using digital media are very minor, as the ways in which these children use technology do not expose them to the same risks as older children. Indeed, Byron (2008) points out that up until the age of seven or eight years, children rarely venture outside of those websites chosen for them by their parents and therefore, the risks to these children are negligible. Despite this, there

is more recent evidence of young children engaging in online interactions, particularly with the rise in popularity of online social networks designed specifically for young children such as Webkinz, Neopets, Club Penguin and Barbie Girls (Marsh, 2010b). Therefore, young children may increasingly find themselves in some of the same situations as older children, particularly in regards to giving out personal information.

However, Selwyn, Potter, and Cranmer (2010) point out that the role of those working with children is to support them in recognising risks related to using the internet and to learn to deal with these risks appropriately. They suggest that technology is here to stay and therefore teaching critical digital literacy is vitally important so that children learn how to keep themselves safe. This idea is also discussed by Livingstone, Haddon, Görzig, and Ólafss (2011) who point out in their research that children can learn how to navigate the world in which they live through engaging with the internet. They go on to suggest that while many risks do exist, these can be mediated by schools who should be acting to 'raise awareness, provide information and guidance and effectively support children' in developing an understanding of e-safety (p.44). In addition to support from schools, it has also been suggested that parents can play an important role in helping children to stay safe online. Valcke, Bonte, De Wever, and Rots (2010) studied parenting styles in relation to internet use and found that parents who exercised a 'hands-on' parenting approach were able to support their children in understanding the risks involved in internet use. However, despite this, Livingstone et al. (2011) found that even with much encouragement to talk to their parents and report inappropriate online content or contact, many children were reluctant to do this and in reality, few children tell their parents when they come across online problems. Therefore, this may add to the concerns of many practitioners who question the use of technology with young children.

As well as moral concerns regarding the safety and innocence of young children, many practitioners who believe that technology is inappropriate for young children point to concerns regarding the link between technology and violent behaviour.

Gunter and Harrison (1997) analysed 4700 hours of children's programmes on British television and found that thirty-nine percent of them contained violence, with a total of 4000 acts of violence across the programmes. By 2002 the number of violent episodes seems to have increased, with Wilson et al. (2002) reporting that seventy percent of the children's programmes which they analysed contained some form of violence. Indeed, they go on to posit that in every hour of children's television programming, children are likely to witness an act of violence every four minutes. This raises the question of whether or not watching violence in the media has an impact on young children.

Erwin and Morton (2008) suggest that violence on television does have an impact on young children. They point out that technology can have three negative effects on young children. Firstly, they suggest that children who are exposed to violence in the media have a decreased sensitivity to other people's pain. Secondly, they may experience increased fearfulness, and finally, they may exhibit higher levels of aggressive or violent behaviour towards others. Reduced sensitivity to violence can be seen in research by Drabman and Thomas (1974) who found that children who had been exposed to a violent film were much more likely to tolerate violence in the real world than those children who did not see the film. These findings are also supported by Smith, Moyer-Gusé, and Donnerstein (2004), who suggest that the link between violence in the media and a desensitisation towards violence was even more pronounced when they were writing in 2004. They point out that the violent television viewed by children in studies such as the one by Drabman and Thomas (1974) contained 'fairly benign depictions of violence' (p.551) such as that found in cowboy movies, and suggest that as the nature of violence in the media has continued to become more graphic and shocking, children may be becoming desensitised to more extreme violence.

The link between violence in the media and increased fearfulness has been highlighted by Erwin and Morton (2008) who suggest that:

> In addition to the violence young viewers witness through children's television programs, they are also exposed to violence through the news media. During dinnertime over two-thirds of American families watch the nightly news on television—thus conveying to children who are too young to fully understand what they are exposed to—that the world is a scary place (p. 106).

These findings also resonate with those of Daly and Perez (2009) who point out that young children lack the maturity to understand many of the images of violence which they see on television and therefore can become increasingly fearful if exposed to such scenes. However, Cantor (2002) points out that the programmes that children view do not need to be inherently scary in order to illicit a fear response in children. Indeed, she reports how an episode of the 'benign' programme 'Little House of the Prairie' was found to have increased fearfulness in a significant number of young children who were frightened by viewing a house fire on the programme and who developed concerns that similar events might happen to them. Indeed, Cantor (2002) goes on to suggest that viewing violence on television can result in a variety of negative emotional responses including generalised anxiety, specific fears and disturbed sleep patterns. It has also been suggested that these fears may not simply be short term concerns but may persist in the long term. In their research, Harrison and Cantor (1999) found that in their study of undergraduate students, ninety percent of them were able to recall being afraid of something they had viewed on television as young children, with over twenty-six percent of the respondents reporting that even at the time of the study, they still experienced lingering fear based on what they had viewed.

As well as causing a reduction in children's empathy, and increasing their levels of fearfulness, it has also been suggested that violence in the media and in video games can increase violent and aggressive behaviour in children. Rideout and Hamel (2006) point out that in their study, 45% of parents of boys ages four to six years say their child imitates aggressive behaviour seen in the media. Indeed, it has been suggested that 'violent program content and poor self-regulation were independently and significantly associated with overall and physical aggression' (Daly & Perez, 2009, p.1). Additionally, research by (Krcmar & Hight, 2007) supports

these findings and proposes that even cartoon violence can significantly increase the aggressive responses of young children. Anderson and Carnagey (2004) also agree, but take the argument further by suggesting that viewing violent images on the television can actually activate an aggressive schema in young children, which can significantly increase their aggressive behaviours. In addition, it has also been suggested that violence is often presented in the media as a good thing. For example, Kort-Butler (2013) points out that in the majority of superhero narratives, the superhero uses violence and aggression to meter out his own form of social justice, without any respect to the law of the land. Indeed, she suggests that 'devotion to justice prevails over devotion to law' (p.53). This notion resonates with that of Adkinson (2008) who points out that the sort of vigilantism which is commonly seen in superhero narratives is seen as acceptable' as long as the ends justify the means. It should be noted that not all research agrees, and it has been suggested that many of the harmful effects of viewing violence on television can be mediated by educating children in media literacy and encouraging them to take a critical approach to what they see in the media (Kotrla, 2007).

However, it is not just what children passively watch on television that has been linked to aggressive behaviour but also the playing of video games with an element of violence. For example, Bartholow, Bushman, and Sestir (2006) report their findings of a direct correlation between violent video game play and an aggressive response to a later task. Indeed, Howard-Jones (2011) concludes that 'video game play is a causal risk factor for aggressive behaviour' (p. 46). However, he goes on to point out that the link between video game play and later behaviour is not only negative. For example, research has demonstrated that playing pro-social video games can increase empathy and pro-social behaviour in participants (Greitemeyer, Osswald, & Brauer, 2010; Gentile et al., 2009), therefore it would appear that the type of game played is important with violent games increasing violent and aggressive behaviour, but pro-social games increasing positive behaviours.

A further moral concern related to technology and early childhood is that technology can encourage children to be involved in activities which may be illegal,

or teach certain undesirable behaviours such as cheating. Indeed, Becta (2006, p.10) suggest:

> Children and young people are vulnerable and may expose themselves to danger - knowingly or unknowingly - when using the internet and other digital technologies. Indeed, some young people may find themselves involved in activities which are inappropriate or possibly illegal.

These illegal activities might involve illegally downloading copyrighted content such as music (Livingstone & Haddon, 2009; Larkin & Awbi, 2006), movies, games and software (Mitropoulou & Triantafylllidis, 2008; Ishizuka, 2004). Indeed, it has been pointed out that only twenty-nine percent of the children in one study thought that downloading such material from the internet was illegal, and many of those who did know that was illegal did it anyway, as they saw it as a faceless crime where no one was being hurt (Ishizuka, 2004).

Although not illegal, using technology to cheat is also a moral concern raised. Rompaey, Roe, and Struys (2002) found in their research that downloading cheat codes online to assist in video game play was a common occurrence, particularly among boys immersed in video gaming culture, and whilst many saw the possible moral issue this raised, a number did not care and only saw the code as a way of advancing in the games ahead of their friends. Indeed, rather than persisting with a game until they achieved success, many children gave up very quickly and resorted to cheat codes to move on in the game, contradicting some of the earlier evidence that technology can encourage persistence in children.

A further moral reason why some practitioners may believe that technology is inappropriate for young children is because of the unacceptable attitudes which are modelled in some aspects of technology. Brown (2011) carried out a content analysis of eighteen episodes of children's television on two of the most popular commercial children's channels, the Disney Channel and the Nickelodeon Channel, and discovered that in just eighteen episodes, there were 468 disrespectful acts committed by the characters in the programmes, including name calling, answering

back to parents, being rude to parents, telling lies and ridiculing another character because of the way they look or dress. Indeed, Brown (2011) concludes that on average, children watching these television programmes are likely to witness these types of behaviours at least once every minute. Based on Social Cognitive theory (Bandura, 1986, 1977) it could then be suggested that children will go on to imitate these disrespectful behaviours themselves (Simcock, Garrity, & Barr, 2011).

2.4. Conclusion

This review of the literature has demonstrated the vast array of literature available on the topic of the impact of technology on young children and as has been demonstrated, this literature is extremely disparate in its findings. While many studies have demonstrated great benefits of technology, others have found that technology is damaging to young children's development in many areas. Perhaps it is these significant variations in the literature which cause many practitioners to be wary of technology, taking a 'better safe than sorry' approach as has been reflected by House (2012) when he states:

> The strongest argument of all for keeping these technologies out of the nursery is surely this. If the critics of these technologies are right, then the implications for young children's healthy development may well be catastrophic; while if the ICT advocates are right, then perhaps the worst harm that can be done is that children will delay slightly the age at which they gain competence with these technologies (p. 115).

This literature review has highlighted a number of key areas to be taken forward in this research. Much of the literature on practitioners' attitudes to the use of technology with young children has been carried out with teachers in schools who work with older children. This study is interested in examining the views of early childhood practitioners who usually work in the private and voluntary sector, rather than in the maintained sector. The literature review has suggested that among teachers, both extrinsic and intrinsic factors affect their views on the use of technology with young children and this study will investigate whether these same

extrinsic and intrinsic factors also influence the views of practitioners working in early childhood settings.

In relation to extrinsic factors, much of the literature suggests that in schools, extrinsic factors such as cost, time and training are no longer issues for teachers; however, there is no literature that relates these findings to early childhood settings and therefore, this study will hopefully be able to enhance this area of understanding.

In relation to intrinsic factors, due to the great variation in beliefs among practitioners about the use of technology with young children expressed in the literature, this study will aim to understand which, if any, of these beliefs are reflected by the research participants. The literature on the topic appears to be very polarised and it will be important to see if these polarised views are also held by the participants in this study. In addition, the literature on the formation of beliefs suggests that there are several key factors which can result in beliefs being formed and this study aims to investigate how these theories of the development of beliefs relate to the participants in this study.

Chapter 3 Methodology

The literature review for this study has highlighted a number of key considerations relating to early childhood practitioners views on the use of technology with young children and has been instrumental in developing two research questions.

1. What views do early childhood practitioners hold regarding the use of technology with and by young children?
2. What factors have influenced the views of early childhood practitioners regarding the use of technology with and by young children?

This chapter aims to identify and discuss the broad methodological approach of this piece of research as well as to examine the specific methods used to select participants and to collect and analyse data. The chapter will begin by highlighting my own positionality and discussing the broad approach taken within the study. It will then move on to introduce the research participants and to discuss how these participants were recruited. The specific methods of collecting data through the use of focus groups and interviews will also be explained and justified, followed by a discussion of the ethical considerations involved and issues around validity and reliability. The chapter will conclude with a discussion of the analytical processes used in coding and interpreting the data.

3.1. Positionality

It is important to begin by discussing my positionality, as Lincoln (1995) points out that for qualitative research to be of high quality it must display 'honesty or authenticity' (p.280) and clearly set out the stance and position of the author. Indeed, Carr (2000) suggests that researchers should embrace their values and relate them to their research rather than trying to deceive themselves and others by suggesting that their research is value neutral.

I began to work as an early childhood teacher in the early 1990s and the use of technology with young children was never an issue, as apart from one BBC

computer in a shared play area, there was no technology in either my classroom or in the schools where I was working. At the start of my teaching career I did not own much technology, apart from a television, as personal computers and other technological devices were very much in their infancy and were only used in secondary schools by those studying specific IT courses. As a result, my entire career of teaching in the early childhood sector was essentially devoid of the use of any technology, apart from the occasional use of a video or music cassette with the children, usually in music or PE activities.

After leaving early childhood teaching in 2002, I began to work as a lecturer in Early Childhood Studies, firstly in a college of further and higher education in Northern Ireland and then, for the past nine years, at an English University. I am currently the programme leader for a master's degree in Early Childhood and as well as leading and teaching on this programme, I also teach a range of modules on an undergraduate programme in Early Childhood Studies. In recent years, I have taught two modules, one for undergraduate students at level 6, and one for postgraduate students at level 7, both of which focus on contemporary debates in the field of early childhood. It was through the teaching of these modules that my interest in the research topic for this study began to develop. A wide range of contemporary issues are discussed and debated, usually very cordially, within these modules; however, I noticed that when the topic of young children and technology arose, there would often be what Byron (2008, p. 1) described as a 'fiercely polarised debate' with a number of students displaying prominent approval for the use of technology with young children, whilst others were strongly against such use. Through debates and discussions within these modules it became clear that this topic was more nuanced than many of the other topics discussed and that the variety of views held by the students were influenced by a wide range of different factors.

At the time of starting the EdD programme, my interest in the views of early childhood practitioners regarding the use of technology with young children was increasing and completing an assignment on the topic during phase one of the EdD confirmed my interest and desire to research this area further and to try to

understand both the range of views around the use of technology with young children and also, the various factors which influence early childhood practitioners to hold these views.

My own personal views about technology and young children are mixed. Whilst I can see the many benefits that technology, when used in a developmentally appropriate manner, can bring to young children's learning, I also have many concerns about the ways in which technology is being used with young children both in the home and in early childhood setting. My work with students on early childhood degree programmes confirmed that I am not alone in my perplexity, and this has resulted in my interest in understanding the perspectives of others who work more closely with young children than I do.

3.2. The Research Approach

Methodology refers to the overall approach taken to a piece of research and is often used to mean the specific paradigmatic stance held by the researcher (Cohen, Manion, & Morrison, 2011). Many different methodological approaches can be taken to educational research with two broad diametrically opposed philosophies taking precedence, positivism and interpretivism, which are influenced by the individual researcher's ontological and epistemological perspectives (Grieshaber, 2010). Clough and Nutbrown (2002, p. 30) indicate that ontology refers to 'a theory of what exists'. On the one hand, there are those who believe that there is 'a knowable world existing independently of the knower' (Pring, 2004, p. 44); however, in contrast, others believe that knowledge can never be independent of the knower but is something which is socially constructed through mutual negotiation with others, and which reflects a person's own experiences of the world (O'Donoghue, 2007). Epistemology is related to ontology; however, whereas ontology is related to notions of truth, epistemology is concerned with how knowledge can be acquired (Clough & Nutbrown, 2002). If the ontological perspective is that truth is able to be discovered, then epistemologically, it must be able to be observed, measured and quantified (Sikes, 2004). If, however, the

ontological view point is that truth is personal and subjective, that reality is socially constructed, then epistemologically it is neither measurable nor quantifiable and is therefore open to interpretation (Clough & Nutbrown, 2002).

These two views have resulted in two diametrically opposed approaches to research. Firstly, a positivist approach has developed which proposes that facts can be confidently ascertained through observation and experimentation (Cohen et al., 2011). However, as Pring (2004, p. 162) points out, 'what is often seen as a straightforward empirical matter is in fact fraught with problems.' Positivist research claims to be objective by eliminating personal views, judgements and values (Sikes, 2004), a notion refuted by Eisner (1992, p. 14) who proposes that in research 'the facts never speak for themselves' and therefore cannot possibly be seen objectively. Indeed, as Pring (2004) points out, education itself is such a controversial topic that it will always be impacted by the values of those conducting research into it.

An alternative and polarised position to positivism is the interpretivist approach to research. Interpretivists propose that a scientific approach to research cannot answer meaningful questions, and therefore in order to understand people it is necessary to know more than simply what they do, rather, what is needed is to understand why they do things, and this can only come about through a subjective interpretation of their actions (Gage, 2007). In the interpretivist approach, researchers do not attempt to deny or eradicate their own personal values from their research. Instead, they accept that holding values is an inevitable part of being human and that far from being a problem in research, values should be acknowledged and used to engage in critical self-reflection (Greenbank, 2003).

Pajares (1992) proposes that researching people's beliefs and attitudes is a complex consideration which can make empirical research fraught with difficulties. He goes on to propose that any study of attitudes or beliefs requires a very careful consideration of methodology for, as Rokeach (1968) suggests, the complexity of attitudes and beliefs on any subject cannot be observed directly, rather they need

to be inferred from what the participants say and even do not say, as well as from their actions. Indeed, Pajares (1992) suggests that the key to successful study of attitudes and beliefs is in relation to the researchers' ability to make inferences from the data, and whilst this can be achieved through both quantitative and qualitative means, a qualitative approach will provide 'richer and more accurate inferences' (p. 327).

Therefore, this study takes an interpretivist approach to research, believing that due to the complexity of human beings, there cannot be simple cause and effect relationships between people and events which lead to a definite understanding of a situation, rather, in order to be understood, research needs to be interpreted (Gage, 2007; Pring, 2004). Indeed, as the aim of this research is to better understand the views of early childhood practitioners and the factors that have influenced these views, an interpretivist paradigm would seem to be the only way to begin to 'understand the subjective world of human experience' (Cohen et al., 2011, p. 21) and enable the researcher to make appropriate inferences regarding the views and attitudes of the participants.

3.3. The Participants

I currently work in an English University which offers a wide range of courses in Early Childhood at both undergraduate and postgraduate level and on both a full time and part time basis. The majority of students on the part time programmes are currently employed in the Early Year's sector and are studying for a qualification alongside their work. For this piece of research, I am particularly interested in the views of early childhood practitioners regarding the use of technology with young children and therefore, this group of part-time students appeared to be a suitable pool from which to select my research participants as they are all working in the field of early childhood and I have easy access to them, as they all come to the University to complete their studies. For phase one of the research, convenience sampling was used to select participants, where I contacted all of the part time students at the University who were completing a qualification in Early Childhood. I

explained the purpose of the research, provided them with an overview of what would be involved in taking part in the study and asked for volunteers to come forward. Hartas (2010) cautions about the use of convenience sampling and suggests that simply choosing participants because they are easily available can introduce bias into the results. However, to try to counteract the students being too similar, I decided to involve students from across the three levels of programme offered at the University.

I planned to conduct one focus group with students from each of the following programmes:

- MA Early Childhood
- BA Childhood and Youth Professional Studies (Early Years Pathway)
- FdA Early Years Practice

There was only one selection criterion to be included in the study and that was that all participants had to be currently working, or have recently worked (within the past three years) in the early childhood sector with children from birth to five years of age. Although there is some controversy about what age group actually constitutes early childhood, with many leading experts proposing that it should be extended to cover children from birth to seven years (Moyles, 2013; Nutbrown, 2012) the current Statutory Framework for the Early Years Foundation Stage (Department for Education, 2017) only covers the birth to five years age range and as a result, this is the age range that has been chosen. Therefore, in order to take part in the study, the participants had to be working or have recently worked with children of this age either in a PVI setting, in a maintained nursery school or children's centre, in a primary school reception class or as a childminder.

Table 3.1 below shows the number of participants who came forward to be part of the study and who met the criterion for participation.

Qualification	Students volunteering to be part of the study
MA Early Childhood	15
BA Childhood and Youth Professional Studies (Early Years Pathway)	5
FdA Early Years Practice	7

Table 3.1 Students volunteering to be part of the study.

The FdA Early Years Practice is a very small programme, which at the time of the data collection, was in the process of being brought to a close at the University and is now only offered at our partner colleges. However, all seven students from the remaining final cohort volunteered to take part in the study. The MA Early Childhood and the BA Childhood and Youth Professional Studies (Early Years Pathway) programmes are both medium to large programmes. The fifteen students who volunteered from the MA Early Childhood constituted approximately sixty percent of the total number of student on the programme, whereas the five students who volunteered from the BA Childhood and Youth Professional Studies (Early Years Pathway) programme only constituted approximately seven percent of the total number of students on the programme. This was a disappointing number from the BA Childhood and Youth Professional Studies programme; however, this could be explained by the fact that I am unknown to these students whilst I am well known to the students on both the MA Early Childhood and the FdA Early Years Practice.

I decided to allow all students who had volunteered to take part in the study and, due to numbers, I divided the MA Early Childhood volunteers into two random focus groups, which resulted in a total of four focus groups altogether. Not all students who volunteered to take part turned up for the focus groups, as warned by Vaughn, Schumm, and Sinagub (1996), and the final numbers of participants can be seen in Table 3.2. This was made up of twenty-one female and one male participant.

Focus Group	Level of Qualification being studied	Number of participants
Group 1	MA Early Childhood	5
Group 2	MA Early Childhood	8
Group 3	FdA Early Years Practice	6
Group 4	BA Childhood & Youth Professional Studies	3

Table 3.2 Focus Group Participants

In phase two of the research I used purposive sampling to select the participants for interview. In purposive sampling:

> Researchers hand- pick the cases to be included in the sample on the basis of their judgement of their typicality or possession of the particular characteristics being sought. In this way, they build up a sample that is satisfactory to their specific needs (Cohen et al., 2011).

In my study, I wanted to ensure that those who took part in the phase two interviews represented the full range of views on the use of technology with young children and therefore, in order to achieve this, I had to include those who could provide information rich data on both sides of the debate (Patton, 1990).

I began by analysing the data from the focus groups and from this, it became apparent which participants were in favour of the use of technology with young children and which participants were not. I categorised each participant from the focus groups on a sliding scale, as seen in figure 3.1 below, based on the views they expressed in the focus groups. Additionally, at the end of each focus group, I checked with each participant to ensure that I had correctly interpreted their views on the subject.

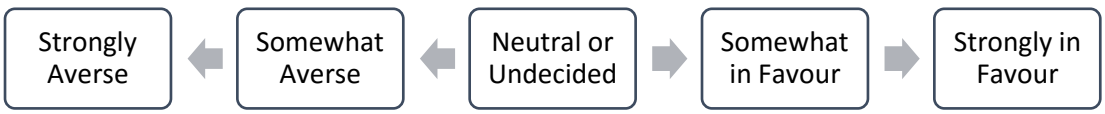

Figure 3.1 Sliding scale used to classify participants in the focus groups

From this, ten participants were selected for the interviews in phase two, who represented as wide a range of different views as was available from the focus groups. I had originally planned to conduct sixteen individual interviews; however, after analysing the data from the focus groups, it became evident that significantly more participants were averse to the use of technology with young children than were in favour of it. In order to preserve a balance of views for the interview phase, I decided to select only ten participants who reflected the broad range of views on the topic. I selected two who were strongly averse to the use of technology with young children, two who were somewhat averse, two who were neutral or undecided, two who were somewhat in favour and finally, two who were strongly in favour of the use of technology with young children. When more than two participants had been categorised as having the same or similar views on the use of technology with young children, I used purposive sampling to select the two who I felt were most representative of the views. Table 3.3 shows the participants selected for phase two. This included one male and nine female participants. For reasons of confidentiality, all participants have been given a pseudonym.

Views on the use of technology with young children as expressed in the focus groups.	Pseudonym of Participant
Strongly Averse	Jess Felicity
Somewhat Averse	Rosie Helen
Neutral or Undecided	Susan Cara
Somewhat in Favour	Karen Julia
Strongly in Favour	Alex Lucy

Table 3.3 Participants selected for phase two of the research.

3.4. Methods of Collecting Data

In line with the interpretivist approach outlined previously, this piece of research takes a qualitative approach to data collection in order to draw out the varying views of early childhood practitioners with regard to the use of technology with

young children, as well as to begin to understand the varying factors that have influenced these views. Within this research I wanted to ensure that the full range of attitudes regarding technology use were present, from deep disapproval at one end, to full acceptance at the other. As a result, I decided to divide the research into two phases. In phase one, I used focus group interviews to enable me to see the broad perspectives of a wide range of different participants to the topic. In phase two, I was then able to select ten participants from the focus groups who represented a broad spectrum of opinion, to participate in in-depth interviews. These interviews then allowed me to probe not only what the participants felt about the use of technology with young children, but also to begin to understand what factors had impacted on their views. The following sections will explain and justify my use of these two methods of data collection.

3.4.1. Focus Groups

Vaughn, Schumm and Sinagub (1996, p. 4) suggest that the goal of focus group interviews is to create 'a candid, normal conversation that addresses, in depth, the selected topic.' As this study aimed to illicit the views and opinions of the participants regarding the use of technology with young children, this was a very appropriate method to use. Gibbs (2012) agrees, and suggests that one of the major strengths of focus groups is that they allow the researcher to gain a large amount of information in a small space of time. This was particularly important to me, as in this study I wanted to ensure that I had a wide range of perspectives on the use of technology with young children, from participants who were very positive about its use to participants who were very negative. If I had chosen to simply start at phase two and interview a small number of participants, I may have discovered that they all shared similar views on technology which would not have helped me to understand the breadth of views on the topic, nor the factors influencing them. The larger number of participants in the focus groups allowed me to see the full range of views regarding technology and from this, I was then able to select participants for phase two who represented the full breadth of ideas on the topic.

Focus groups are useful in allowing the views of the participants to emerge, and Cohen et al. (2011) suggest that when the opinions of a specifically chosen sector of the population are sought, focus groups may yield insights that might not have been available through other methods.

Focus groups were also chosen as they provide opportunities for the researcher to clarify and extend points made by the participants in order to gain more accurate information about what the participants actually think. Bell (2010) concurs and suggests that the most valuable reason for the use of focus groups is that in-depth information on how people think about an issue can be collected. Additionally, Vaughn et al. (1996) suggest that in a focus group, the participants can provide support for each other and may be more willing to express opinions when they feel that they don't have to answer every question and only participate in the discussion when they feel comfortable to do so. This was evident in the focus groups conducted as everyone participated in the group discussion and appeared to be relaxed and engaged. However, not everyone participated at every stage during the focus groups, only contributing when they wanted to or felt comfortable to do so.

However, focus groups also have their limitations. Gibbs (2012) highlights the vital role of the moderator in focus groups, and suggests that a focus group will only be successful if there are good levels of group leadership from the moderator. I moderated all of the focus groups myself, and as I am an experienced moderator, having used focus groups in research several times before, I feel that the groups ran smoothly and successfully.

Hayes (2000) points out that for focus groups to be successful, they have to be carefully balanced in terms of the age and sex of the participants, as groups with people of diverse ages may result in participants feeling constrained, and therefore not contributing freely to the discussion. The participants in my research were of very diverse ages, with the youngest participants in the 18-24 age bracket and the oldest participants in the 55-64 age bracket. I originally considered taking the

advice of Hayes (2000) and organising the focus groups by age; however, I felt, along with Gibbs (2012), that there were other aspects of homogeneity, other than age, which were more important to ensuring the comfort of the participants. I decided to organise the focus groups so that the participants were in the same group with other students from their programme of study. All the participants had been studying at the University for at least one year and therefore knew the other students in their cohorts very well, therefore, I felt that keeping them in these groups would much better provide the safe space for discussion that Gibbs (2012) suggests is so important. This approach is also supported by Wellington and Szczerbinski (2007) who suggest that focus groups can be more effective if the participants feel at ease with each other. My approach to teaching involves a lot of in-depth discussion and debate and therefore I felt that the participants from the MA Early Childhood and the FdA Early Years Practice programmes, whom I have taught over the past few years, would already be very used to having in-depth discussions together, and would therefore be more open with each other than with participants who they did not know from the other programmes.

As well as considering the correct mix of participants in each focus group, other key considerations were required. The number of participants in each focus group had to be carefully considered. The general consensus seems to suggest that between four and twelve participants is a suitable number for each focus group (Gibbs, 2012; Cohen et al., 2011; Cousin, 2009; Wellington & Szczerbinski, 2007). Fifteen students from the MA Early Childhood group volunteered to participate in the research and therefore I decided to divide them into two random groups to ensure that the group was not too large and unwieldy (Cohen et al., 2011), a group of seven and a group of eight. Two volunteers from this cohort did not turn up for the focus groups and unfortunately, they had both been allocated to the same group, so this resulted in one focus group of five and one focus group of eight from the MA Early Childhood. The FdA Early Years Practice focus group consisted of six members which fitted well within the recommended group size, but unfortunately, only three of the five students who had volunteered from the BA Childhood and Youth Professional Studies programme turned up for the focus group. This resulted in a focus group

size smaller than that advocated in the literature, which could possibly allow the dynamics between the participants to have a disproportionate effect on the discussion (Cohen et al., 2011). However, Toner (2009) proposes that very small focus groups with as few as two participants can still produce valuable data, and it would have been wrong to deliberately silence the small number of participants who turned up by cancelling the focus group. Therefore, I went ahead with the focus group with only three participants, and although the numbers were small, this group seemed to have just as much to say as some of the larger groups. Indeed, having more opportunity to be involved in discussion because of the small numbers, may actually have allowed these participants to have their voices heard more effectively than in some of the larger groups (Toner, 2009).

Each focus group lasted approximately thirty minutes, which is shorter than the forty-five minutes to two hours advocated in the literature (Cohen et al., 2011; Wellington & Szczerbinski, 2007). However, as Gibbs (2012) points out, the key consideration in designing a focus group is how it can address the research questions, and as the purpose of the focus groups was predominantly to ascertain whether the participants had largely positive or largely negative views towards the use of technology with young children, I felt that thirty minutes was sufficient. If focus groups had been the only method of collecting data then thirty minutes would not have been long enough to explore each person's perspective in an in-depth manner; however, as the focus groups were only one methods of data collection, and I was using them predominantly to develop themes for the subsequent interviews (Cohen et al., 2011) and to assist in the purposive sampling and selection of participants for the interviews, I felt that the thirty minutes yielded a good range of appropriately rich data which fulfilled my purposes.

The focus groups were conducted in a seminar room in the University building in which I work and where the participants are studying. This was a convenient venue as the participants are all familiar with the building, the seminar rooms are bright and spacious and ample parking is available, which all meet the criteria for a suitable location (Cohen et al., 2011; Wellington & Szczerbinski, 2007).

Focus groups differ from group interviews in that while group interviews rely on a back and forward questioning approach between the researcher and the participants, focus groups rely on the interactions within the group and between the participants (Cohen et al., 2011). This allows for the participants to spark ideas in each other (Wellington & Szczerbinski, 2007) and extend and elaborate on comments made by other participants (Hobson & Townsend, 2010). In order to facilitate this interactive approach, I did not have a specific list of questions that I wanted to ask but instead, prepared a guide sheet with some general topics for discussion (see appendix 1) which allowed the participants to freely express their views on the topic. I felt it was important to initially set the participants at ease (Wellington & Szczerbinski, 2007) therefore I began each focus group by showing the participants some photographs of young children using technology and asking them to comment on what they felt about each photograph. I felt this was a particularly useful way to begin the focus groups, as there was something tangible to look at and talk about. This use of photographs was also used in the individual interviews and will be discussed more fully in the next section. After the photographs had been discussed, I simply asked the participants to discuss how they personally felt about young children using technology, and allowed the discussion to progress naturally. I was prepared to offer as little or as much facilitation as necessary but as the focus groups progressed, I realised that these particular participants did not need much facilitation and were more than happy to discuss their views on technology very openly. My role then, rather than asking specific questions, was mainly to ensure that all participants had an opportunity to speak, and that no individual participant was dominating the discussion (Cohen et al., 2011). Occasionally, the discussion veered off topic and I had to refocus the participants on the topic in hand, but this only happened occasionally and the participants were engaged in a very naturalistic discussion with each other for the majority of the time.

With the participants' consent, I recorded the focus groups using a very high-quality voice recording system which I borrowed from the University where I work. Wellington and Szczerbinski (2007) warn of the need for good quality recording

equipment in focus groups as poor-quality microphones may be acceptable for one to one interviews, where the microphone can be placed close to the participant, but in focus groups, where the participants may be sitting around a large table or in a large circle, a poor quality microphone may not pick up all the voices (Bloor, 2000). The equipment used was bought by the University for the specific purpose of recording meetings to allow accurate minutes to be generated, and therefore has several multi-directional microphones built in. This resulted in an excellent quality recording of each focus group, even though during one of the groups, a groundsman was using a leaf blower directly outside the window.

It has been suggested that each participant in a focus group should be provided with a transcript or written account of the focus group for approval after it has been completed (Gibbs, 2012; Wellington & Szczerbinski, 2007). However, I felt uncomfortable about providing each person with a written account of what everyone else in the group had said, as well as what they had said themselves. As an alternative, at the end of each focus group I summarised my understanding of the discussion which had taken place, and confirmed with each participant that I had accurately identified their general feeling about young children using technology and that they were still happy for me to use what they had just said in my research.

3.4.2. Interviews

In phase two of my research, I conducted semi-structured interviews with ten participants from the focus groups, who had been identified as having a wide range of different views on the use of technology with young children, ranging from being very much in favour of the use of such technology to being very much opposed to it. In-depth interviews can be described as:

> Purposeful interactions in which an investigator attempts to learn what another person knows about a topic, to discover and record what that person has experienced, what he or she thinks and feels about it, and what significance or meaning it might have (Mears, 2012, p. 170).

This would appear to be an extremely suitable method of data collection for my study as I am not only interested in what my participants know, but in what they think and feel about the use of technology with young children, and what might have influenced them to hold such views. Opie (2004) proposes that there are three different types of interview which are broadly aligned to the researchers underlying methodology. Structured interviews have many similarities to a questionnaire where a series of simple, straightforward questions are asked, to which the respondents give simple, direct answers. This type of interview is usually carried out with a large number of participants and can be particularly useful for gaining quantitative as well as some qualitative data (Wellington & Szczerbinski, 2007). Opie (2004) points out that this style of interviewing fits best within a positivist methodology where quantifiable data is desired; however, this does not meet the needs of my interpretivist study as I am particularly interested in understanding the complex nature of the participants' views and the underlying factors that have influenced them, which, by its very nature, is not quantifiable. At the other end of the interview spectrum are unstructured interviews (Opie, 2004). This style of interview has no preconceptions about the direction the interview will take, but follows the flow of ideas from the participant, and can be particularly beneficial in allowing the participant to speak in their own words about what matters to them (Hobson & Townsend, 2010). Initially, this may have seemed a very suitable approach for my qualitative study, where my main interest lies in the participants' views and perspectives on the use of technology with young children. However, I learned from the focus groups that it is very easy for the participants to lose the focus of the conversation and to go off at a tangent, and as Hobson and Townsend (2010) point out, completely unstructured interviews can often result in the specific areas of interest of the researcher not being addressed in an in-depth enough manner.

In terms of structure, a middle ground between these two approaches to interviewing is the semi-structured interview. This type of interview is more flexible that a structured interview and therefore allows the researcher to probe more deeply into participants' answers in order to more fully understand their views and

ideas (Opie, 2004). Semi-structured interviews can begin by using some predetermined questions, but there is the flexibility to stray from these questions and to follow up on things the participant says by probing more deeply. The major advantage of this approach is that it can ensure that the researcher's agenda is covered in full whilst allowing the participant to talk, in their own words, about the things that matter to them (Hobson & Townsend, 2010) as well as enabling the researcher to make more accurate inferences regarding the participants' attitudes and beliefs regarding technology use by young children (Pajares, 1992). This approach seemed to be the best one for my research as I had some specific topics, arising from the focus groups, which I wanted to explore more fully with the participants but I also wanted them to have the freedom to tell me more about their views on technology without me having a predetermined idea about the areas that might be covered.

Several topics arose in the focus groups which I wanted to explore in more detail. Issues were raised by the focus group participants regarding the age of the child, the types of technology used, supervision and the social use of technology by young children. I could have asked some specific questions of the participants to explore these topics more fully, for example, I could have asked, 'What age do you think is appropriate for young children to begin using technology;' however, I decided to begin the interview by using photo elicitation to encourage the participants to talk more openly (Hurworth, 2012). Harper (2002) suggests that the difference between using images in an interview, as opposed to using words on their own, lies in the responses that can be evoked. He goes on to propose that:

> Images evoke deeper elements of human consciousness that do words; exchanges based on words alone utilize less of the brain's capacity than do exchanges in which the brain is processing images as well as words. These may be some of the reasons the photo elicitation interview seems like not simply an interview process that elicits more information, but rather one that evokes a different kind of information (p.13).

The father of photo elicitation, John Collier (Collier, 1957), compared the nature of the data collected in photo elicitation interviews and compared it with that collected in standard dialogic interviews, and came to the conclusion that photo elicitation can produce more in-depth responses from the participants. It is this deeper level of engagement that I hoped to generate with the participants and therefore, this seemed like an appropriate method to use. Indeed, Hurworth (2012) suggests that by using photo elicitation, participants are more likely to answer without hesitation, which can also be beneficial for seeing their real views on a topic.

I selected four photographs, which I felt represented the first four topics I wanted to explore in more detail from the focus groups. These topics were the age of the child, different types of technology, supervision and the social use of technology. Figures 3.2 to 3.5 show the images used.

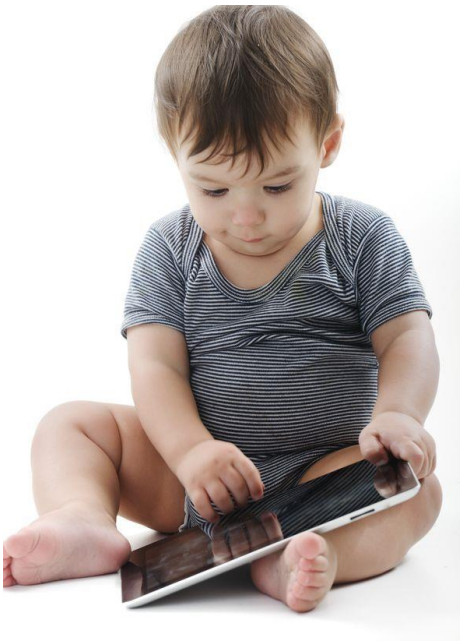

Figure 3.2 Photograph 1 from Photo Elicitation Interview

Figure 3.3 Photograph 2 from Photo Elicitation Interview

Figure 3.4 Photograph 3 from Photo Elicitation Interview

Figure 3.5 Photograph 4 from Photo Elicitation Interview

In the next part of the interview, I wanted to explore the participants' own personal experiences of using technology across their lifetime. Asking the participants to tell me verbally about their experiences of using technology may have resulted in aspects of their experience being omitted, due to the fact that there would be a lot of information to share, so I wanted to find a method that would enable the participants to think through their key experiences with technology before we talked about it, and to have some sort of visual aid to support the discussion. Kolar (2015) suggests using timeline mapping, which enables the researcher to create a timeline with the participant in order to put life events into chronological order. In Kolar's (2015) research she draws a visual timeline as the participants are talking to her, but I wanted to give the participants time to think through their timelines before speaking to me so I decided to adapt Kolar's (2015) approach, and encourage the participants to draw a visual timeline of their personal experiences of using technology and then use it to talk me through their experiences. I gave each participant a blank timeline marked with 'birth' at one end and 'today' at the other and after showing them an example timeline I had created of my own personal experiences with technology, I asked them to take some time to complete the timeline with their own experiences. Once these were complete, I then asked the participants to use the timeline to talk me through their experiences and, as in any other form of semi-structured interview, I was then able to probe for more details

when required. This approach had many benefits. The participants were able to ensure they had included all of the relevant information they wanted to share, and the information was presented in a clear and chronological order, so it was easy for the participant to explain and the researcher to follow (Kolar, 2015; Adriansen, 2012). This enhanced the qualitative interviews and increased mutual understanding between the researcher and the participant (Kolar, 2015).

The rest of the interview took a more traditional semi-structured approach, with some open-ended questions (see appendix 2) and the opportunity for the participants to elaborate on their ideas and for the researcher to probe for more information.

I carried out a pilot of the interview approach with one participant, Felicity, which provided me with the opportunity to practice my interviewing technique and develop my skills of probing for further clarification. I tested out the use of photo elicitation and timeline mapping and confirmed that they appeared to work well and provided a large amount of in-depth data. No changes were made to the interview process as a result of this pilot; however, there were issues during the pilot with the recording equipment, and this served to make me more careful and aware of setting up and using the recording equipment for the other interviews. As there were no changes made to the planned interview process, I decided to use the data collected from this pilot interview with Felicity in the main part of the research.

It is good practice to provide the participants with choice in where and when research interviews should be held (King & Horrocks, 2010) therefore, the participants in my study were given a range of options regarding the time and location of the interviews. Participants were offered a range of days and times for the interviews both on week days and at weekends and also during the day or in the evening, in order to provide them with maximum flexibility. As a result of this flexibility, I was able to provide every applicant with a date and time that suited them for the interview. The University where I am employed has a number of

campuses spread across three different towns and therefore, the participants were given the opportunity to have their interview in any of the University campuses or at a neutral venue such as a coffee shop in a location convenient to the participant. Nine of the participants chose to meet me in one of the University buildings across three different campuses, and one participant requested a meeting at a coffee shop local to where she lived, as she did not drive and lived a considerable distance from a University campus. The University venues met the criteria suggested by Cohen et al. (2011) as a suitable interview venue, as I was able to use quiet rooms with few distractions or interruptions from outside; however, the coffee shop venue proved to be more problematic. King and Horrocks (2010) warn of the problems of noisy environments, and although the interview was conducted in the early evening when the coffee shop was not as busy as it might be at other times, there was still quite a bit of background noise and disturbance. The participant and I were able to sit at a table in the back corner, away from the favoured tables at the window, and so I was able to minimise some of the noise. The participant indicated that she was happy to participate in the interview in that location. I was fortunate to have access to a very high-quality recording device through the University where I work, and this ensured a clear recording of the interview, despite the background noise.

One University-based interview proved slightly problematic as the participant was not able to find childcare at the time of the interview and therefore brought her two children with her. King and Horrocks (2010) warn of this type of situation and I asked the participant if she would like to reschedule the interview for another day when she had access to childcare. However, this participant decided that she would rather do the interview when she was there and that her children would play quietly at the back of the room. The children were exceptionally well behaved throughout the interview and did not disturb proceedings at all; however, I felt that this participant did not fully engage in the interview process as a result of always having one eye on her children, and this interview proved to be the shortest of all the interviews conducted.

King and Horrocks (2010) suggest that a specific duration should be set for each interview; however, I decided not to have a fixed duration but instead explained to the participants that the interview could last as long as they wanted and they could say as much or as little as they wanted at each stage. For purposes of planning I informed the participants in advance that the interviews would not last for more than one hour. This resulted in the interviews lasting from between nineteen minutes at the shortest to fifty-five minutes at the longest with the average duration being approximately forty-five minutes.

All interviews were recorded with consent from the participants using a high-quality recording device, which resulted in clear, quality recordings (Wellington & Szczerbinski, 2007). After the interview, these recordings were used to generate transcripts, and each participant was provided with a copy of their transcript for approval (Gibbs, 2012; Wellington & Szczerbinski, 2007). Field notes were also taken during the interviews, noting any specific aspects of body language that were particularly significant; however, these were kept to a minimum so that I was able to focus my attention on the participant, and ensure them of my interest in what they had to say (King & Horrocks, 2010).

3.5. Ethical Considerations

'Ethics has to do with the application of a system of moral principles to prevent harming or wronging others, to promote the good, to be respectful, and to be fair' (Sieber, 1993, p. 14). Throughout this study, ethical principles outlined by the University of Sheffield (2016) were carefully adhered to, along with the British Educational Research Association guidelines (BERA, 2012). Ethical approval from the University of Sheffield's ethics review panel was applied for and the study only commenced once this approval had been received (see appendix 3). There were a number of ethical considerations which had to be taken into account before, during and after the research.

3.5.1. Terminology

The first ethical consideration was that of deciding on what terminology to use to describe the people who were taking part in the study. Oliver (2010) suggests that the researchers' attitude towards the research and towards those involved in the research is evident in the terminology they use to describe them. Terms like 'research subjects', 'research respondents' or 'research participants' are often used and each have a different connotation with regard to how they are viewed. The term 'research subject' suggests a positivist perspective on research, where the person involved is passive in the process. This term also suggests a power differential between the researcher and those involved in the research and as Oliver (2010, p. 5) points out, this can 'depersonalize the members of the sample, and reduce them to a subservient role in the research process' which may not be the most ethical practice. The term 'research respondent' may be more ethical as the free will of the person to be involved in the research is implicit in the term; however, this still implies a one-way flow of information which does not fit well with my interpretivist methodology. The final term, 'research participant' implies more of an involvement in the research, and is more appropriate for a qualitative, interpretivist study, where the researcher places 'great emphasis upon the unique contribution of each individual' (Oliver, 2010, p. 6) and values the input they have into the study, not simply the data they can provide. As a result, I have chosen to refer to research participants throughout my study, as I feel that ethically, this highlights the role of the participant, not just as a source of data but as a valuable contributor to the overall research strategy (Palaiologou, 2016).

3.5.2. Consent

Informed consent is at the heart of ethical research (Coady, 2010). This means that it is important for researchers to ensure that all participants are fully aware of the purpose of the research and the risks which might arise from being involved (Greig, Taylor, & MacKay, 2013). It is also important that full information is given to the participants in a form which they can easily understand (Sikes, 2004). In order to do this, I created a leaflet for the prospective participants which clearly outlined all the

key features of the proposed study (see appendix 4). I went along to speak to the prospective participants when they were in the University attending a class and spent some time with them, explaining the research and answering any questions that arose. I then gave each person a copy of the written information about the study, a copy of the participant consent form (see appendix 5) and asked them to think about whether or not they would like to participate. The following week, I went along to their class again and collected signed consent forms from anyone who was willing to be involved in the study. I also reassured the students that there was no obligation to be involved in the study and that refusing to take part would not reflect on them in any way. As well as gaining this initial consent, it was also important for me to gain ongoing consent as ongoing consent cannot be taken for granted (Miller, Drury, & Cable, 2012). In order to do this, I reminded each participant at the beginning of the focus groups and at the beginning of each interview that they were free to withdraw from the research at any time and that they should not feel under any obligation to participate. Once I had collected some data, I also wanted to ensure that I had ongoing consent from the participants to use that data. It has been suggested that one way of doing this is to provide the participants with a transcript of their contributions to the research and to ensure that once they read these, they are still happy for the material to be used (Gibbs, 2012; Wellington & Szczerbinski, 2007). After conducting the individual interviews, I made a transcript of the interview and sent it to the participant for their approval and for any amendments that they wished to make. Nine of the participants were happy for me to continue to use the data collected in the interviews with no amendments; however, one participant felt that her meaning did not come across clearly in one part of the interview, and therefore she asked me to amend the transcript in the light of an explanatory statement which she sent to me by email. This was done and this participant was then happy for her data to continue to be included in the study. However, with regards to the focus group, I had some reservations about providing the participants with a transcript of the whole focus group. This would not only have given them a written account of what they themselves had said, but it would also have given them a written account of what each of the other participants had said in the group. As I could not be sure that the

participants would keep this transcript confidential, with other people's words recorded on it, I decided not to provide a written transcript to the participants. I could have provided each participant with a written transcript of just their own contribution to the focus group; however, this would have meant that they could not see the context of their words and it may have served to confuse matters for the participants. In order to obtain ongoing consent, and to ensure that the focus group participants were happy for me to use the data from the focus groups in my study, at the end of each focus group, I summarised my understanding of the conversation as it has progressed and I confirmed with each participant that I had correctly interpreted their personal views on the use of technology with young children.

3.5.3. Anonymity, Confidentiality and Data Protection

Another key ethical consideration is to ensure anonymity, confidentiality and data protection for each participant (Palaiologou, 2016). Indeed, it has been suggested:

> …our primary obligation is always to the people we study, not to our project or to a larger discipline. The lives and stories that we hear and study, are given to us under a promise, that promise being that we protect those who have shared them with us (Denzin, 1989, p. 83).

Anonymity can be defined as ensuring that no information provided by the participants can be used to identify them (Cohen et al., 2011). There are many ways in which this can be done such as using codes or numbers to represent a participant rather than their name (Cohen et al., 2011) or using a pseudonym chosen by the participants themselves or by the researcher (Coady, 2010). The use of numbers or codes to identify participants can seem very impersonal and is more often used in positivist methodologies, therefore I decided to invite the participants to select their own pseudonyms. However, after much hilarity and discussion about appropriate pseudonyms, the participants agreed that I should select the pseudonyms on their behalf. As the study progressed, one ethical issue came to light regarding anonymity. In the study, the participants were all female, with the exception of one male participant. When allocating pseudonyms, I allocated a

female name to the female participants and a male name to the male participant. However, it quickly became apparent that by using a male name and referring to the male participant using male pronouns, it would be easy for anyone who had been involved in his focus group to identify him from the research. I initially considered giving this participant a gender-neutral name but this did not do away with the issue of using male and female pronouns, so I decided to contact the participant and explain to him the various options available to protect his anonymity. After explaining the situation to this participant, he concluded that he did not mind if the other participants from his focus group were able to identify him from the research, as they all knew each other anyway, and as long as he remained unidentifiable to anyone outside of the study, he was happy to be known in the research as Alex and have male pronouns used in the discussion.

Assuring confidentiality to participants is also an important ethical issue. Confidentiality can be described as not disclosing any information about a participant which could lead to them being identified (Cohen et al., 2011). In order to ensure confidentiality, I decided not to collect any very specific data from the participants such as exact dates of birth or exact locations of employment. Instead, I collected personal information in broader categories such as in age bands, rather than in specific ages, and also ensured that I did not speak to anyone else about the research in any way which identified the participants. In the focus groups, I also explained about confidentiality and asked the participants to ensure that they did not share anything said in the focus group outside of the group. However, to ensure a higher level of confidentiality of the focus groups, I decided not to provide participants with a transcript of the focus groups, where it might have been possible for a participant to show others what someone else had said, as discussed in the previous section.

Data protection was ensured by adhering to the Data Protection Act (1996). Any identifiable data collected from the focus groups and interviews such as audio recordings and participant details sheets were all stored on a password protected

computer to which only I have access. At the end of the study, this data will all be deleted with only anonymised data kept beyond that point.

3.5.4. Recording of Focus Groups and Interviews

An additional ethical issue which needs to be considered when interviewing participants either individually or in groups is ensuring the accuracy of the data collected. Participants may speak very quickly, and if they are being interviewed in focus groups, more than one participant might speak at the same time. If the researcher is trying to transcribe what is being said as it happens, it is likely that only part of the speech will be captured, which may lead to inaccurate or incomplete data (Bloor, 2000). In addition, if the researcher attempts to write up the notes in retrospect, there is the possibility of researcher bias, as the researcher may only remember certain aspects of the conversation (Opie, 2004). An alternative to taking notes during an interview is to audio record the interview for transcription at a later date. This ensures that the researcher is free to focus on the participants, and is not preoccupied with trying to note down what is said (Thomas, Nelson, & Silverman, 2011). I chose to take this approach and used a very high-quality audio recorder to record the focus groups and the interviews. However, this raised a number of ethical issues. Firstly, I had to ensure that the participants were comfortable and had time to decide if they were agreeable to being recorded (Hennink, 2014). To do this I explained how the recording would work, how it would be stored and how it would be used, both when I met with the participants prior to the research, and also on the participant information sheet. I then gave them time to decide if they were happy to be recorded, and all were agreeable. At the beginning of each focus group or interview, I also reminded the participants about the use of the audio recorder, and checked again to make sure they were agreeable to being recorded. Alongside the audio recording, I also briefly noted down any significant body language or other nonverbal communication such as facial expressions which added to data (Hennink, 2014). Having recorded data of the participants voices can lead to ethical issues regarding confidentiality. In order to protect the participants, I ensured that all recordings had a file name which did

not include the participants' names (Magnusson & Marecek, 2015) and that the audio files were stored on a password protected computer only accessible to me (Cohen et al., 2011). At the end of the research these audio files will be deleted.

3.6. Analytical Processes

Cohen et al. (2011, p. 537) indicate that:

> Qualitative data analysis involves organizing, accounting for and explaining the data; in short, making sense of data in terms of the participants' definitions of the situation, noting patterns, themes, categories and regularities.

The four focus groups and the ten individual interviews generated a great deal of raw data, but as Denscombe (2010) notes, data in a raw form is not much use but needs to be organised into a format that can be more easily and systematically interrogated. This organisation began with the process of transcribing the focus groups and interviews.

3.6.1. Transcription

In order to convert the audio recordings of the focus groups and interviews into something manageable, it was necessary to transcribe them. Male (2016) suggests that there are many different approaches to transcription, which range from focused transcription (Gibson, 2010) including all the pauses, hesitations, false starts and extraneous noises such as 'er' and 'um' made by the participant at one end of the spectrum, down to a written summary of what was said at the other end. Bathmaker (2004) highlights the time-consuming nature of transcription, but warns that if a transcription is not used, but instead, a summary of the discussion is prepared by the researcher, the richness of data could be lost, as at such an early stage in the research, it is not easy to determine what should be included and what should be excluded from the summary. As a result, I decided to attempt what Gee (1999) describes as a 'broad' transcription of the audio recordings where as accurate a transcription as possible is created in order to preserve meaning, but many of the features of a focused transcription, such as pauses, hesitations, false

starts and extraneous noises are omitted, unless they are felt to be particularly pertinent to the meaning (see appendix 6 and 7 for examples from the transcripts). I transcribed the focus groups myself and as Bathmaker (2004) points out, this was extremely time consuming, with each thirty minute focus group taking between five and six hours to transcribe. Focus groups have their own particular challenges for a transcriber as there are numerous speakers who can often speak over the top of each other (Bloor, 2000). I consider myself to be adept at using word processing software and I can type reasonably quickly, but the length of time it took to transcribe these focus groups was extreme, and therefore I decided to use a transcription agency to assist with the transcription of the individual interviews. The time taken to generate an accurate transcription had to be weighed against the cost of having a professional transcribe the interviews, but in the end, I was able to locate a reasonably priced transcription service who were able to provide a confidentiality agreement. Once these transcriptions had been completed, I then checked them for accuracy (Male, 2016) and sent them to the participants for approval and comment.

3.6.2. Use of NVivo

Once the transcripts had been prepared, I decided to use NVivo software to help with the organisation of the data. Cohen et al. (2011) claim that the major benefit of using software like NVivo is that it removes the risk of human error from the sorting of large amounts of qualitative data. There has been much criticism of the use of software like NVivo in the data analysis process, with the concern being raised that 'the technology might turn the researcher into an unthinking and unfeeling human being' (Hesse-Biber, 1995, p. 27), blurring the lines between quantitative and qualitative analysis and imposing the logic of survey research onto the analysis of qualitative data. Stanley and Temple (1995) also point out the problems associated with using computer software for qualitative data analysis. They suggest that the purpose of qualitative research is to allow the researcher to interpret the data based on the context and their understanding of it, and this is not possible using computer software. However, as Bathmaker (2004) points out, it is

possible to use computer software to help in the management of large amounts of qualitative data, but still allow researchers to immerse themselves fully in the interpretation of the data. The software does not do the analysis, it simply organises the data to make the job of analysis simpler, and it was in this manner and for this purpose that I used NVivo. The NVivo software itself allows for both the automatic and manual generation of codes, and perhaps the automatic generation of codes might warrant the criticism levelled by Stanley and Temple (1995); however, I did not use the automatic facility and simply used NVivo to sort and store my focus group and interview transcripts while I used the manual facility to generate my own codes and find and revise themes for analysis.

3.6.3. Data Analysis

Cohen et al. (2011) suggest that there are seven different ways in which qualitative data can be organised and presented - by participant groups, by individual responses, by themes, by research question, by research instrument, by case study and finally by narrative. In this piece of research, I decided to organise the data by theme. I felt this was a beneficial approach to take as it allowed me to make comparisons across participants, to draw out the main issues, and identify and analyse patterns and themes (Gibson, 2010; Braun & Clarke, 2006). However, as the main themes emerged, I found that my two key themes were also in line with my two research questions, with theme one addressing research question one and theme two addressing research question two. Each theme then had a number of subsidiary themes which will be detailed later in this section.

I used the guidelines provided by Braun and Clarke (2006) to guide my thematic analysis. Phase one of their approach is to become very familiar with the data therefore, I began by reading and re-reading the focus group and interview transcripts and listening several times to the audio recordings, in order to immerse myself in the data (Robson, 2011; Braun & Clarke, 2006). Once I was very familiar with the data, I began to consider how it could be analysed and decided to use a process of inductive thematic analysis as suggested by Braun and Clarke (2006).

This inductive approach does not utilise any pre-existing coding frame, but uses a bottom up approach to examine the complete dataset and identify themes as they arise (Male, 2016; Braun & Clarke, 2006). Phase two of Braun and Clarke's (2006) guidelines for thematic analysis is to generate initial codes. These codes could be described as labels which are assigned to chunks of data that are similar in meaning, in order to 'describe and categorise' the data (Cohen et al., 2011, p. 561). Using NVivo software, I worked through all the transcripts, sentence by sentence, using open coding (Cohen et al., 2011) to create nodes (NVivo's name for codes) based on my initial interpretation of what the participants were saying (Gibbs, 2012). I felt, along with Braun and Clarke (2006, p. 89), that it was important to give 'full and equal attention to each data item' rather than only selecting the data which initially seemed to answer my research questions. In this way I feel that I was able to allow the voices of my participants to be truly heard. Gibson (2010) suggests that it is important not to create too many codes; however, after this first round of coding, I had generated 117 codes. This was clearly the 'coding crisis' identified by Gibbs (2012, p. 255) which can result in the data feeling overwhelming, and can prevent the researcher from developing a clear understanding of the data, hindering further analysis. However, Braun and Clarke (2006, p. 89) suggest that this should not be considered problematic at this stage in the analysis, and propose that the researcher should code for as many different themes as they can as 'you never know what might be interesting later' and this proved to be excellent advice for me. My primary interest in this piece of research is in relation to the participants' views on the use of technology in early childhood settings and at the beginning of the coding process, I was tempted to discard any reference to the participants' views about their own children's use of technology in their own home situations. However, taking the advice given by Braun and Clarke (2006), I coded this anyway, and it quickly began to emerge that this was a very significant factor in shaping the views and attitudes of many of the participants, which would have been lost if I had not coded it.

At this stage, I had to consider how to make these codes more manageable and to do this, I utilised phase three of the guidelines provided by Braun and Clarke (2006)

where they suggest that once initial codes are generated, the researcher should then search for themes within the codes. Themes identify the ways in which the different codes relate to each other and group together codes that have something in common (Gibson, 2010). Braun and Clarke (2006) propose that this sorting or grouping is actually the beginning of analysis as the researcher is considering how different codes can be merged in order to discover some principal themes. This process generated ten different initial themes as can be seen in table 3.3.

Benefits of technology	Different types of technology
Problems with technology	Pedagogical Beliefs
Confusion about views on technology	Feelings about technology
Why participants don't use technology	Problems with using technology
Personal experiences with technology	Practical issues

Table 3.4 Initial themes identified in the coding process.

Phase four of the guidelines proposed by Braun and Clarke (2006, p. 92) is to review and refine the themes in order to further clarify the key themes which are emerging. They classify this as the 'fine-tuning' stage, and this process resulted in the formulation of two key themes and seven subsidiary themes from the data. Phase five of the guidelines recommends defining and naming the themes in order to ensure clarity, and this process resulted in the final designation of the key themes and subsidiary themes as identified in figure 3.6 (see appendix 8 for the NVivo coding report).

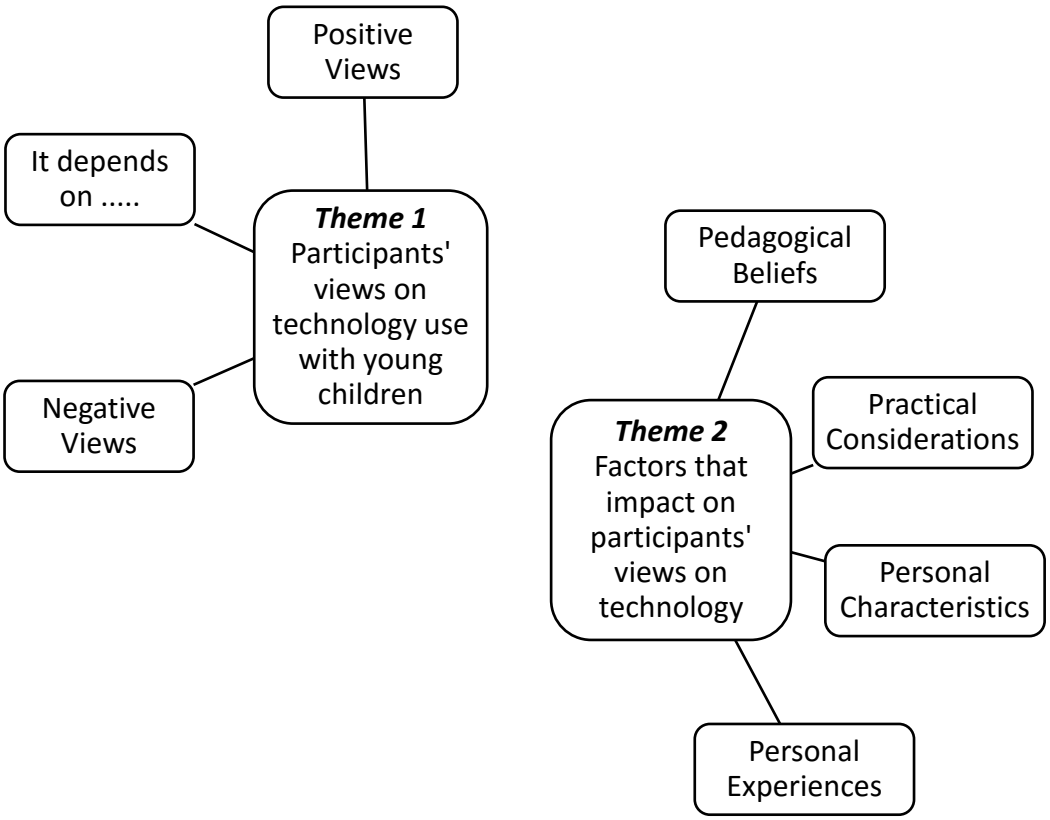

Figure 3.6 The final key themes and subsidiary themes identified.

The final aspect of thematic analysis, as outlined by Braun and Clarke (2006), is to produce a written account of the data, which aims to 'tell the complicated story of your data in a way which convinces the reader of the merit and validity of your analysis' (p.93), and this can be seen in the following chapter.

Chapter 4 Presentation and Interpretation of the Data

The aim of this chapter is to present and analyse the findings from the focus groups and interviews conducted for this piece of research. The two research questions for this study were.

1. What views do early childhood practitioners hold regarding the use of technology with and by young children?
2. What factors have influenced the views of early childhood practitioners regarding the use of technology with and by young children?

This chapter seeks to address these questions using a process of thematic analysis to analyse and interpret the data collected and to provide 'a concise, coherent, logical, non-repetitive and interesting account of the story the data tell' (Braun & Clarke, 2006).

The previous chapter presented a thematic map, outlining the two key themes and seven subsidiary themes which emerged from the data. The two key themes were very much in line with the research questions for this study and this chapter will examine each of these themes in turn in order to help address the research questions fully.

4.1. Participants' views on technology use with young children

The first key theme is in line with the first research question and addresses the different views that the participants had about the use of technology with young children. These views were either positive or negative, which are the first two subsidiary themes; however, a third subsidiary theme emerged from the data which I have named 'it depends on…'. This theme demonstrates the nuanced views of the participants and suggests that their attitudes towards technology may not necessarily be simple to define.

4.1.1. Positive Views

The first positive view that was expressed by many of the participants was that technology was important for preparing young children for the future. Wolfe and Flewitt (2010) propose that all children need to develop their abilities using technology if they are to be able to function effectively as members of a modern society which highly values knowledge and communication, and this view was reflected among a number of the participants. Three slightly different ideas were suggested by the participants in relation to this. Firstly, a number of participants pointed out that technology was essential for young children's future academic life and would be very important for them to succeed when they go to school. For example, Helen, in her interview, alluded to the fact that, as children progress through school, technology becomes increasingly important, and therefore she suggests that it is 'absolutely essential' that they learn how to navigate a range of different types of technology. Secondly, several participants highlighted the importance of being able to use technology effectively in order to be able to obtain a good job in the future:

Alex: *If you want to get a good job you have got to be able to use it [technology].*

Lisa: *Technology is a massive part of society now and most jobs will require you to be computer literate.*

Ruby: *Everything seems to be coming online now. You know applying for jobs is online.*

Thirdly, a number of participants pointed out that young children need to be able to use technology in order to fit into the culture in which they live. The prevalence of technology in modern society was pointed out several times, for example, in her interview, Susan states that 'we all use technology increasingly…. that's life, that's our culture' and suggests that in order to be part of this culture, young children need to become comfortable with technology. Indeed, a number of participants suggest that preventing young children from using technology could actually be preventing them from fully participating in their culture. For example, in her

interview, Helen points out that it would be extremely unfair on a child if they were the only one in the class who didn't know how to use technology. This idea was picked up by other participants, who stated:

Julia: *I think it would be wrong for an early year's classroom not to represent it because it's there and I think we have a responsibility to reflect children's everyday lives.*

Helen: *They've got the technology side, they've got to learn to use it. It wouldn't be fair not to, you know?*

However, it should be noted that for some participants, this view that young children need to be able to use technology to prepare them for their future lives was not necessarily seen as a good thing. A number of participants agreed that technology was important for young children as a preparation for the future but at the same time, they wished that this was not the case. For example, in her interview, Karen acknowledged that technology is an ever-increasing necessity for young children's futures; however, wistfully stated '…but I do regret that there are things about childhood, that I value, that don't seem to be happening now because of technology.' This will be discussed later in this analysis.

Additionally, a number of participants reflected views similar to those of Robinson (2010), which stresses that the uncertainty of what lies in the future for children should encourage an educational focus on the development of ideas, particularly related to creativity, rather than on the development of specific skills, which may be obsolete in twenty years. This was highlighted by Helen in her interview where she indicated that in early childhood, a focus on language and communication is more important for the young child's future than a focus on the use of technology.

As well as preparing children for the future, another positive view that was reflected by many of the participants was that technology was important for motivating and engaging young children, particularly for those who do not find traditional educational methods interesting. Many participants commented on the fact that when technology is used in their setting, the children really enjoy the

session and are very keen to get involved in the activity. One participant, Cara, described in her interview how when one of her work colleagues brought in a tablet from home, the children were crowding round to have a turn and were very enthusiastic to be involved in the activity. Indeed, Plowman et al. (2012) suggest that technology can have many motivational benefits for young children, such as developing the disposition to learn, allowing self-directed learning, increasing self-esteem and confidence and encouraging persistence. These ideas were reflected in many of the participants' responses:

Lisa: *I think it has helped massively with engaging children. I think if you are ever struggling to engage a child, the use of a computer or an iPad or a camera, video camera, recorder, anything like that can have a massive impact on them.*

Cara: *We've got children that come in, and they will sit, and they'll come in and go further into the phonics. They'll be reading, and they'll be recognizing letters, and writing letters, just because [of the technology].*

Julia: *For some children, it's a way of getting them to Join in, where they perhaps wouldn't join in.*

A number of participants noted particularly how important technology was for motivating and engaging the boys in their setting. In his focus group, Alex echoed the ideas of James (2010), as he discussed the difficulties of engaging some young boys in mark-making activities and commented on the benefits of technology for these reluctant writers:

Alex: *But I mean, for boys who don't want to write [iPads] can be a fantastic tool to use.*

Carol: *We use the iPads especially for our boy writers. There are programmes on it to help them.*

However, it should be noted that some participants commented on the fact that because of the motivational pull of technology, it was often used in their setting as a bribe or a reward for either appropriate behaviour or for completing some other less attractive task. In this case, several participants expressed concern that this was not an appropriate use of technology and undermined the potential of the

technology to act as a learning tool. For example, Caitlin commented, in her focus group, on how technology was often used as a means of controlling children and keeping them quiet, and Briony, in her focus group, suggested that for some teachers, it is simply used as a means of keeping children occupied while the teacher does something else, rather than being used to motivate children to learn:

Briony: *I think it's quite easy because we are always being told our classroom needs to be tidy so I think it's quite easy to say 'you play with that iPad, we'll tidy up.'*

A further positive view of technology use with young children that was voiced by many of the participants was the idea that technology has many educational benefits for children. Goldschmied and Jackson (2004), key theorists in early childhood education, promote the use of heuristic play as a rich learning tool for very young children, allowing them to freely explore a range of everyday objects. Many of the participants in this study viewed technology in this exploratory way, even though it is not a natural object, and saw items such as iPads as just another object which young children can explore and learn from. Alex, in his interview, highlighted the value of young children exploring technology for themselves:

Interviewer: *You think it's important then for young children in early years settings to use technology?*

Alex: *Yes, massively because they're like sponges, they learn, they explore, they grasp concepts a lot easier at this age.*

In her interview, Julia expressed a similar view when shown a photograph of a baby using an iPad. She commented that he is just a baby and babies naturally explore, and later, she went on to highlight the potential of technology for encouraging exploration:

Julia: *I think they are a really good part of the early year's classroom. I love the idea of cameras. I think children taking pictures, exploring their world, because you do get a different perspective when children go out with the cameras.*

As well as encouraging exploration, a number of participants commented on the educational potential for technology to promote problem-solving, as suggested by Yurt and Cevher-Kalburan (2011). This can be clearly seen in Julia's interview:

> *Julia:* *I think [young children] problem-solve in a way with technology that they don't perhaps do as much when you're just doing quite structured numeracy and literacy. I think they think outside the box more when they've got [technology] because they're more in control… so they think, "Right, well, we could work this out, and I'm going to ask him. I'm going to show him my iPad now or ..." I think there is that collaboration and that sort of…. what is it…. sustained shared thinking.*

Many participants commented on the fact that technology could open up educational opportunities to young children that they would not be able to easily access in any other way. For example, Cara commented on the way she was able to use technology with young children to help them to further their interest in outer space. Using video clips from YouTube, the children were able to see things in space that cannot be seen without a telescope, which the nursery did not have access to. Rosie also highlighted how technology can open up opportunities for young children by talking about how she was able to use the internet to show the children a fireworks display, which some of the children had been unable to see in real life, and Felicity talked about being able to show children things on the internet, for example, the inside of a Mosque, which would require a great deal of expense and organisation to take them to see in real life. However, it should be noted that not all participants agreed that this was an appropriate use of technology and, following the lead of many key theorists in the early childhood (Kay, 2012; Tovey, 2012; Athey, 2007), they placed a strong emphasis on the importance of real first-hand experiences for young children, rather than the sort of secondary experiences that they might be offered through viewing things using technology.

Another educational benefit of technology which was expressed by a number of the participants was the value of technology to support children with Special Educational Needs and Disabilities [SEND] or children with English as an Additional

Language [EAL], which resonates with the findings of a number of researchers in the field (Moody, Justice, & Cabell, 2010; Wolfe & Flewitt, 2010; Andrews, 2003). In the focus groups, Barbara, who works specifically with children with SEND, commented on the motivational aspect of the use of technology with children, particularly those with Autism Spectrum Disorder [ASD], and highlighted that in her setting, technology is the only way to engage some of these children. In her interview, Susan also reflected this view when she described a boy with ASD who learned to communicate with his family by first interacting with Siri, a voice controlled personal assistant on Apple digital devices, both ideas reflecting those proposed by DiGennaro Reed, Hyman, and Hirst (2011) on the benefits of technology for children with SEND.

However, other participants disagreed with the idea that technology is beneficial for children with ASD. In her focus group, Caitlin commented on how some children with ASD can become fixated on technology and trying to get them to do something else can be problematic. Indeed Lucy, in her interview, discussed her personal experiences of using technology with a child with ASD:

> *Lucy:* *My oldest who is Autistic, he becomes absolutely obsessed with his DS (a hand-held computer games console) to the point that's all he wants to do… I've seen it happen to children who don't have Autism, but I think he becomes more obsessed because of his Autism.*

Julia works in a reception class but specialises in supporting children with speech and language difficulties, and she pointed out the very great benefits of technology for these children, particularly when used in conjunction with role play, which resonates with the work of Burnett (2010) and Huffstetter et al. (2010). Additionally, Kirsty, in her focus group, highlighted how technology can be used to support children with EAL and described how technology enabled her to assess some children new to her setting who were unable to speak any English. She also commented that without technology, she would not have been able to tell what they understood and did not understand.

Therefore, a wide range of positive views were expressed by the participants and even those who had predominantly negative views about technology were able to see some positive aspects in its use.

4.1.2. Negative Views

A number of negative views were also expressed by the participants regarding the use of technology with young children. The first negative view expressed by many of the participants was that technology is having a negative impact on young children's cognitive development. A number of participants talked about their concern that technology was replacing real experiences for young children:

Felicity: *It's detracting from all those things that we do or we feel are important, its detracting from sitting singing nursery rhymes and reading books and playing games with the child. Perhaps it's again used as a default button, so rather than growing things, we maybe look at a video, or we watch a program instead of actually doing it, and again technology can be used as a default button when really they should be spending an afternoon doing something rather than again having it shown to them and that I think has made the early years a less rich experience.*

Susan: *From what I see at work and what I wonder about at work, if [technology] is a substitute for other games, other talking, other language, other expressions, other emotions, other engagements, that's not good enough. It's not real. It's not a real experience for that child.*

Many participants appeared to have strong views about the sorts of hands-on, practical experiences that young children should be having in early childhood, reflecting the active learning style proposed by Duhaney and Duhaney (2008) as being essential for good cognitive development. Activities such as baking, playing board games, doing jigsaws, playing outside, digging in the mud, reading books, playing with blocks, engaging in role play and singing nursery rhymes were all highlighted as important activities for young children, and many participants were concerned that technology was taking up time that could be better spent on these more practical activities. Some participants pointed out that many of these activities could be augmented by the use of technology, for example, reading a digital book with a child; however, others commented that they felt that this was

not a real experience, but a simulated one and that reading a real book where real pages needed to be turned was a much better experience for young children. Karen, in her focus group, gave an example from her own family where she believed that technology was not supporting the child's cognitive development in the same way as if the activity had been done without the use of technology:

Karen: *My grandson is 9 months old, and last night he sat on his mum's knee and she was sat behind him and they had nursery rhymes on the iPad in front of him and she was singing to him but he couldn't see her face. He could hear her but they were both looking at the iPad so really, if we're thinking about language development, he wasn't looking at his mum's face… and I wonder how much that interferes with the development of language, to see the mum's face, to see how she articulates the words, what shape her mouth is making… it's not like singing a nursery rhyme [face to face].*

This reflects findings by Honig (2007) which indicate the importance of face-to-face interaction for oral language development.

Even some of those participants who were predominantly positive about technology use in early childhood expressed concerns about using it in their setting because they believed that children were overloaded with technology at home and therefore the setting should be a place to experience something different. Julia, who was one of the participants with the most positive views of technology commented:

Julia: *[Early childhood] is about getting real and enriching experiences and even with our setting, there are some children that are not getting those enriching experiences at home because they are having too much access to just being put in front of [technology].*

As well as negative views related to cognitive concerns, many participants also expressed negative views related to moral concerns about the use of technology by young children, particularly concerns around keeping children safe. One of the major concerns expressed was around the notion of children being able to accidentally access unsuitable material using technology, particularly if the technology is portable and can be taken away from a supervised area. Taylor, in her

focus group, gave the example of children in her setting using an internet search engine to search for 'games for girls' and a large number of unsuitable sites of a sexual nature were at the top of the list of sites found. This echoes the findings in the Byron Review (Byron, 2008) where it was reported that 12% of children aged between five and seven years had come across harmful or inappropriate content on the internet in the previous six months. Felicity pointed out in her interview that no parent would give their young child the television remote control and leave them to watch whatever they liked, but she queries why many parents are happy to leave their child unsupervised with access to the internet on a tablet computer, where they can access material just as unsuitable, if not worse, than what they could find on the television. Some websites were highlighted as being particularly problematic by the participants. YouTube was highlighted as being very popular among children as they can find cartoons and episodes of their favourite television programmes, as well as post their own videos of their play on computer games, such as those identified by Marsh (2015). However, some participants highlighted the unsuitable nature of many videos on YouTube for young children, so while the supervised use of YouTube was seen as educationally useful in the previous section, its unsupervised use was seen as a major concern. Some participants talked about the value of software which could be installed on devices to block access to inappropriate sites; however, many suggested that early childhood settings and particularly parents, are unsure about how to use this software and therefore, children are still able to access inappropriate material. However, it was interesting to note that a number of the participants discussed how their settings were actively working to educate both parents and children about keeping safe online, in order to prevent children from negative experiences, reflecting the ideas of Selwyn et al (2010), that one of the key responsibilities of schools is to educate children in how to use technology safely.

It was interesting to note that whilst much of the literature on technology and the safeguarding issues it presents, relates to the potential for children to make contact with or be contacted by people who intend to do them harm (Šmahel, Helsper, Barbovschi, & Dědková, 2012; O'Connell, Price, & Barrow, 2004; Bullen & Harré,

2000), in this study, this issue was barely raised and did not seem to be an area of concern to the participants. This may be due to the fact that they are all working with children under the age of five years, and perhaps children of this age, as Byron (2008) suggests, are not engaging with online activities which could lead to this issue because they cannot yet write in order to communicate. However, one participant, Carol, did note that one of her concerns is that the ability to type is now no longer necessary to communicate online, and even very young children could use the webcam built-in to many devices to communicate with others whom they do not know.

As well as concerns over safeguarding children, another moral concern that was expressed by many participants was in relation to the amount of violence that young children can be exposed to through technology. This was particularly a concern when young children were playing games that have either a fifteen or eighteen age rating and are not supposed to be played by anyone younger than this. Indeed, Julia talked about children as young as four years of age coming into reception class talking about playing age-restricted violent games. However, as Lucy pointed out, it is the responsibility of the parents to ensure children do not access inappropriate material at home, and there would be no opportunity to engage with violent material in the setting.

Interestingly, whilst much of the literature on violence and technology is concerned with the extent to which violent material can foster violent behaviour in young children (Daly & Perez, 2009; Krcmar & Hight, 2007; Rideout & Hamel, 2006; Anderson & Carnagey, 2004), this was not an issue mentioned by the participants in this study. Indeed, whilst many stated that they were concerned about violence and technology, none really articulated why they were concerned. This may be because in an early childhood setting, children would not be able to access violent material and therefore, for the majority of these participants, while they are concerned about what children are doing at home with technology, they feel that keeping violence out of the early childhood setting is all they can really do.

As well as negative views surrounding the impact of technology on young children's cognitive development and also moral concerns regarding technology, many negative views were also expressed about the negative impact of technology on young children's social development, reflecting the views of Abbs et al. (2006). I am in no way attempting to make any quantitative analysis of the data in this study however, it was interesting to note that when participants were discussing their concerns about technology, words such as 'isolating' and 'solitary' came up more than any other, with almost forty references by the participants. Many participants talked about the captivating nature of technology, which they felt could result in children focusing so much on the technology that they do not interact with anyone around them:

Jess: *They can be in a trance and you know it's like they are entranced.*

Felicity: *I think its complete absorption.*

Karen: *For some reason, that I don't think we understand just yet, iPads or tablets, can mesmerize children.*

Many participants also indicated their concern about the solitary nature of technology and how they perceived that children usually engage with it alone, limiting their opportunities for social interaction, reflecting ideas proposed by Mistry et al. (2007):

Carol: *There is no interaction and that's the bit that bothers me about tablets and stuff. It's the lack of interaction.*

Helen: *It does bother me that I think they are a bit addictive, and they can be a bit isolating because a lot of them, you're playing against the computer. That isn't great. I don't think socially, certainly at preschool, is that meeting the social needs of the child? I don't think so.*

Nora: *It is very solitary in a way. There is no socialising because they are so focused on [the technology].*

This perceived lack of interaction raised concerns for many of the participants regarding the development of social skills; however, a number of participants pointed out that in their settings, technology is always used socially by a group of

children together, which reflects the findings of Lim (2013). Therefore, rather than isolating the child, some participants felt that technology actually helps children to socialise and work together as they help each other complete the game or activity.

In addition to these negative views, other negative views were expressed by a small number of participants relating to the negative impact of technology on young children's physical development, health and imagination, as well as concerns over the ways in which technology promotes consumerism. However, the most significant negative view which was expressed by almost every participant was not in relation to the technology itself, but with the way in which it was being used with young children. Even those participants who were most positive about technology expressed strong concerns about the ways in which both families and early childhood settings were using technology. Rather than technology being used purposively to support young children's development, almost every participant used some variant of the term 'digital babysitter' or 'electronic babysitter' to express their concerns:

Felicity: *[Technology] becomes like a babysitting tool and [parents] need to realize that it's not that.*

Kirsty: *I think that's done [giving the child technology] to keep the child quiet rather than it to be a learning tool.*

Helen: *I think [my] biggest concern is it's used as a babysitter, or it's used just... It's not used effectively.*

Concerns about technology being used as a digital babysitter were highlighted firstly in relation to the way that parents use it in their home situations, which reflects the findings of Beyens and Eggermont (2014) and Rideout, Vandewater, and Wartella (2003). A number of participants commented on how they see technology being used simply to keep children quiet and occupied while their parents do something else, as Ruby, in her focus group, commented:

Ruby: *That's the selling power of [technology], parents think "oh that'll keep them quiet for a bit while I go and do X, Y and Z."*

As well as this, a number of participants highlighted that technology, as they saw it, is being used to provide an easier life for parents. For example, Helen talked about her memories of when her children were younger and how she was constantly running around taking them from one activity to another, from swimming to football to dance class. She went on to suggest that many parents no longer need to do this in order to keep their children occupied, instead, they now provide them with technology and the children will happily engage with it, rather than other activities, making the parents' lives easier.

Many participants also highlighted the way in which some parents use technology to keep their children quiet when they are outside the home. The use of technology in restaurants was highlighted, where at a family dinner, rather than seeing families interact with each other, the children are now sitting with tablet computers or something similar to prevent them from disturbing the adults. Susan commented that even in food outlets such as McDonalds, which are promoted as being family-friendly restaurants, tablet computers are now set up to keep the children entertained during their meal, limiting family interaction. Annie also indicated that some parents use technology to keep their children quiet in public to save them from being embarrassed by their children's behaviour and she recounts an incident which happened on the bus on the way to participate in the focus group:

Annie: *I was sitting on the bus on the way here and there was a little toddler… and she was sitting in the push chair. The mum sat her on her knee and then she put her back in the push chair and she gave her the keys to play with. Then the next thing she gave her a mobile phone…The mum gave it to her because she started crying and it was the way of keeping her quiet on the bus because I think the mom was a little bit flustered and embarrassed because she was making noise.*

However, although many participants disagreed with this use of technology, they did indicate that they understood the reason behind it. For example, in her interview, Cara stated:

Cara: *At the end of the day when [parents] have been in work all day, and they are absolutely exhausted, I do think part of them just goes, "You*

know what, to save the tantrum, here we go [have a tablet computer]." To a degree, I understand that is how it works. It doesn't mean you're a bad parent just because you let them use [technology].

Indeed, a number of participants admitted to doing this themselves with their own children; however, what seemed to be of most concern to them is the length of time technology is used in this way. Several participants talked about needing five minutes peace now and again and considered technology to be acceptable for that, but as Jess pointed out in her interview, five minutes can turn into twenty minutes very easily and Helen highlighted how it could be very tempting to leave the child for a much longer period:

Helen: *I think it's one of those things that you think yeah, but it's only for two minutes or something. But it wouldn't be, if that keeps a child quiet, then a very tired mother will leave it for as long as she can possibly get.*

As well as expressing concerns about technology being used as a digital babysitter in the home, a number of participants also expressed concerns about technology being used as a digital babysitter in the nursery or classroom. For example, Caitlin, in her focus group, talked about technology being used in a classroom as a way of controlling children and keeping them fixated on something, rather than having them cause trouble. As well as keeping them out of trouble in the classroom, other participants discussed how they see technology being used in a negative way to free up the teacher to do other things. For example, Bryony, in her focus group, discussed the pressure that teachers in her setting were under to keep their classrooms looking tidy and attractive and therefore, they often resorted to putting the children in front of some sort of technological device in order to be able to tidy up and organise the classroom. Felicity also discussed this use of technology when she described a teacher she has worked with:

Felicity: *This teacher, instead of singing nursery rhymes and doing actions and stories, she'll put it on the interactive whiteboard… and then often she gets on with her own work and just leaves the class watching it.*

None of the participants saw this as an effective use of technology and as Helen summed up, if technology is only being used as a way of keeping children quiet, it is not acceptable and leads to negative views of technology.

Much of the literature on the 'digital babysitter' attributes this title to the use of television (Beyens & Eggermont, 2014; Zimmerman, Christakis, & Meltzoff, 2007); however, it was interesting to note that in this study, the participants did not mention television but attributed the term to other forms of technology, particularly tablet computers and mobile smartphones, and this may be an interesting indication of the changing use of media, moving away from fixed televisions towards more portable digital devices, as suggested by Ofcom (2016).

4.1.3. It all depends…

As can be seen in the previous sections, a range of both positive and negative views were expressed regarding the use of technology with young children; however, the third subsidiary theme in this section reflects an additional set of views which are not documented significantly in the literature, but which showed up as an important theme in this research. The participants' views on the use of technology were not as straightforward as being simply positive or negative and many participants expressed mixed views, being both positive and negative about technology use, depending on a number of characteristics.

The first key characteristic which caused participants to express mixed views about technology use was the age of the child. This theme came up in the focus groups and in order to explore it further, in the interviews, I showed the participants pictures of children of different ages using technology. It was interesting to see the variety of different ages which the participants felt were appropriate for the use of technology. There is little literature on the use of technology with very young children; however, Lindahl and Folkesson (2012) propose that it can be beneficial for children as young as two years of age. A small number of participants agreed:

Lucy: My personal belief is technology is fine for all ages, because they need to start somewhere and start learning and exploring.

However, the majority of participants felt that technology was unsuitable for very young children. Many of these participants felt that an appropriate time to begin engaging with technology was in the year before children begin formal schooling, which is often referred to as the preschool year, and serves children aged three and four years; however, some participants felt that even this was too young. For example, Josie felt that preschool was too young to begin to use technology and that children should not be using technology at all until they begin formal schooling at age five. Some participants went even further than this and suggested that technology was inappropriate for both children in early childhood settings (birth to five years) and children in Infant School (five to seven years):

Interviewer: *What age then do you think that it would be appropriate to introduce a child to technology?*

Felicity: *I think when they're able to know when it's the right time to leave it or switch off from it or be able to use it in an appropriate manner, so I would say upper juniors. I don't see any value in infants.*

Therefore, for many participants, their views on the use of technology were negative for very young children but more positive for older children as they move into preschool and beyond.

As well as the age of the child, many participants reflected the ideas presented in some of the literature (Health and Social Care Information Centre [HSCIC], 2010; Parízková & Hills, 2005) and felt that their view of technology was affected by how long it was being used for. Many participants felt that as long as technology was only being used with young children for a short period of time, then this was acceptable:

Naomi: *If it's just for a short period of time I don't think there is anything wrong with it. We've got tablets in our preschool and at the end of the night when it's quiet time and there's not many children left and they've been*

busy all day, we will get them out and they'll play educational games or things like that.

Kirsty: *We have [iPads] in my reception class, and we'll have 2 out as continuous provision and there's a timer so they have to write their name on a list and they get 10 minutes. They have to turn the timer over and when their ten minutes is up they have to come off; and they can have a go in the morning and they can have a go in the afternoon, so its twenty minutes out of the whole day.*

Many participants also talked about young children needing a balanced experience in early childhood, as proposed by many early childhood experts (Kay, 2012; Nutbrown, 2011; Whitebread, 2003) and indicated that they were more positive about technology use in early childhood as long as it was only a small part of a wide range of activities the children were engaging with:

Julia: *You've just got to keep it as a balanced thing in the early years, haven't you, and you've got to have all those outdoor experiences, dressing up, reading books, music, drama, but technology, you can slide it into it and enhance it.*

Therefore, as long as technology was only used for a short length of time and was part of a wide range of other activities, participants were more positive about its use. However, many participants felt that while they could control the amount of time that young children used technology in the early childhood setting, and therefore they felt positive about its use in that location, they commented that they had no control over the amount of technology children were using at home, and therefore they were more negative about its use there:

Julia: *You can do what you do in school but you can't dictate to parents that when they go home that they should be doing this or that. I mean quite often parents will come and say "I can't get them to bed" and you find out it's because they are watching television in their room so you can do what you do in school but you can't regulate it once they get home.*

Many participants also felt that young children were engaging excessively with technology in their home environments, reflecting the findings of Parízková and Hills (2005) and therefore, although they had generally positive views about the use of technology in early childhood settings, they were not positive about its use at

home. For example, in her interview, Susan was able to discuss many positive aspects of technology but despite this, she was unwilling to use technology in her setting because she felt the children got enough of that at home:

Susan: *We have the children for two and a half hours [each day]. My understanding of what the children engage with outside of the setting suggests that this is two and a half hours when they can have a break from television and screens.*

A number of participants' views on technology also depended on the type of technology being used. Throughout the focus groups and interviews, the participants discussed two main types of technology, which I have called screen-based technology and active technology. Screen-based technology mainly included televisions and computers, whilst active technology included items such as digital cameras, programmable control robots such as Bee Bots and Roamers, and electronic toys, particularly linked to role play, such as cash registers. The majority of participants expressed positive views about the use of active technology with young children but were more negative about screen-based technology, reflecting the findings of Sweetser, Johnson, Ozdowska, and Wyeth (2012). For example, I asked the same question to Felicity and Helen:

Interviewer: *Do any [types of technology] make you feel more or less comfortable than others?*

Felicity: *Yes. Things like the camera or the Roamer make me more comfortable, I can understand that because it's got some small educational value. I've used those a lot with children in school because they're not a screen.*

Helen: *At least again [with a digital camera], they're engaging with their environment aren't they, because they're looking at something, taking the picture, and then looking at it in the camera. They're actively engaged with what's going on around them rather than just looking at something being presented to them on a box.*

These ideas were also reiterated by Julia who pointed out how much she liked the use of Bee Bots because the children were down on their knees, being active as

they played. Julia also particularly highlighted the benefits of using digital cameras with young children:

Julia: *I love the idea of cameras. I think children taking pictures, exploring their world… because you do get a different perspective when children go out with the cameras. I think they work together well and I know that even in some early years settings, they let them take the camera home which is a good ... (We're not spying on them) but sometimes it's that you build up a relationship with home and you get to know what they like and what's part of their world, so I'm a big fan of the camera in the classroom.*

However, more negative views were expressed about the use of screen technology, and particularly computers, games consoles and televisions. A number of participants echoed the findings of researchers such as Breen, Pyper, Rusk, and Dockrell (2007) and described practical difficulties in using computers with young children, which made them feel more negative about them. For example, the fact that school ICT suites are often set up for older children, on larger furniture which was unsuitable for young children, made some participants reluctant to use them. Additionally, the difficulty for some very young children of operating the keyboard and the mouse also made some participants more negative about computers.

Despite the many negative views expressed about screen technology, one type of screen technology produced more positive views among the participants – the iPad or other equivalent tablet computer. A number of participants explained how they preferred tablet computers over the more traditional desktop or laptop computer because of their accessibility:

Julia: *[The computers] are not set up for the early year's child, and I think you end up spending half your time getting them sat correctly and you don't get as much done, whereas the iPad is instant. Once you've set it up they can work on their own or they can work as part of a group. I am actually a fan of the iPad in the classroom.*

Lucy: *It's less disruptive to bring in a box of iPads than it is for the whole class to move to another part of the building [to use the ICT suite].*

As well as being more easily accessible, a number of participants commented on tablet computers also being much simpler for children to use as they didn't require the use of a mouse, which was considered too awkward for very young children. The touch screen nature of a tablet computer was much praised for its simplicity, as highlighted in the literature (Lynch & Redpath, 2014; Verenikina & Kervin, 2011; O'Mara & Laidlaw, 2010) and Kirsty highlighted that finger technology is the way of the future:

> *Kirsty:* *That is the way technology is going. I tried to use computers with children of that age and they can't use a mouse, they don't know how to, but from about the age of one or two they are being brought up with iPads so finger technology is the way forward.*

However, it is interesting to note that a number of participants were only using tablet computers with children in a similar way to other active technologies, for example, Karen discussed using the iPad with the children to take photographs and to make movies and Jess, who described herself as '…not a fan of iPads in the early years' elaborated that what she actually meant was that she is not a fan of games on the iPad, but can see the usefulness of the iPad for taking photographs. Therefore, it would still seem that more positive views are held about the use of active technologies and more negative views are held about screen-based technologies, with the exception of tablet computers, which elicit more positive views when they are used in an active manner, for example to take photos or make movies.

Finally, the views of many of the participants regarding technology seemed also to depend on whether the technology is being used in a solitary or social way. The importance of social interaction in early childhood was highlighted by almost every participant, and many of the negative views about using technology with young children reflected the views of Abbs et al. (2006) and were in relation to their perceptions of young children becoming fixated on the technology and therefore becoming isolated from their peers. However, when technology was used in a social way, participants expressed more positive views about its use. In the focus

groups, I showed the participants some photos, in the first a child was using a tablet computer alone and in the second two children were using a tablet computer together. Very negative views were expressed by many of the participants when they looked at the first photo; however, many more positive views were expressed regarding the second photo, and this seemed to be predominantly due to the fact that the participants saw social interaction as being vitally important for young children and they could see the social interaction in the second photo. For example, some comments on this second photo of two children on a tablet computer together included the following:

Jess: *[That's better because] they are communicating, they are learning something, they are interacting*

Ruby: *I was just going to say [the difference is] the human interaction. There are two of them rather than one isolated.*

Karen: *You can imagine a narrative there can't you. You can imagine that that iPad is the subject of a conversation whereas in the other one there is no one to talk to about what you are doing.*

However, while many participants felt that the social use of technology was most appropriate for young children, many commented on how they felt even more positive when the interaction was between an adult, the child and the technology, rather than just children using the technology together without an adult. The need for adult supervision was expressed by almost all the participants, with this being an important factor for making the participants more positive about the use of technology with young children. Initially, it could be assumed that this was for safeguarding reasons; however, it became clear during the interviews that although the participants saw supervision as important for keeping children safe, this was not their primary reason for feeling supervision was essential for young children using computers, rather, the purpose of the adult was to ensure that using technology was a learning experience:

Cara: *I just like technology to be used with adults nearby, just to keep them guided.*

Felicity: *(In response to a picture of a parent and child using a tablet computer together) As long as dad's there and they're doing something together and dad is talking through it then, you know, this is a learning experience and there is interaction going on.*

Karen: *I think they need an adult supporting them. Young children, ones to twos, can gain from technology, but as something with an adult, not on their own. I think there is a clear distinction.*

Therefore, many of the participants felt more positive about the use of technology if active technologies were used with children over at least the age of three or four years, for a short period of time in social groups, and they were carefully supervised by an adult. However, when the children were younger and when screen technology was used or children were left alone and unsupervised to use technology, participants expressed more negative views.

4.2. Factors that impact on participants' views on technology

The second key theme is in line with the second research question and addresses the factors that have influenced the views of the participants with regards to young children and technology. This theme has four subsidiary themes – pedagogical beliefs, practical considerations, personal characteristics and personal experiences.

4.2.1. Pedagogical Beliefs

The views of most of the participants in this study seemed to be strongly influenced by their pedagogical beliefs about the nature of early childhood care and education. All of the participants in this study are currently engaged in completing qualifications in Early Childhood at a range of levels, from foundation degree to master's degree and are therefore engaged in a great deal of reading and research on the topic of working with young children. This research has had a significant impact on the views of the participants regarding the most effective pedagogical approach to take and therefore has influenced their views on technology. Interestingly, the qualifications themselves do not seem to have had a solely positive or solely negative impact on the participants' views about technology. For example, both Julia and Rosie undertook the same module about technology and

childhood on a master's degree, but whereas Julia commented on how much undertaking this module had made her feel more positive towards technology, particularly in widening her understanding of what constitutes technology in early childhood settings, Rosie had the opposite perspective, and expressed that doing this module had reinforced her view that technology was not appropriate for young children. The different ways in which this module affected the participants may be explained by the level of the module. At master's degree level, students are encouraged to read widely around a topic, and whilst they are guided to an initial range of reading material, in order to achieve higher marks, students need to demonstrate that they have gone beyond the recommended reading material to explore particular areas of interest in much more depth. Therefore, Julia and Rosie may have selected a very different range of reading material which may have resulted in positive views from one and negative views from the other. A number of other participants also talked about how their reading and research had influenced their views on technology:

Felicity: *If you look at the research, there is a lot of research now that's actually saying no, we should take all technology out of primary schools until 11 years old. They don't need it, they need to have experiential learning, they need to use their imaginations and you implement [technology] just in secondary school.*

Josie: *In my research I found.... I can't remember where now.... but there is no regulation in this country for the amount of time children should spend on technology and one [article] said that children are spending, from the age of six onwards, the average was about seven hours a day on some sort of technology.*

Therefore, it would seem that the participants were strongly influenced by the things they were reading for their academic qualifications. However, it may be interesting to consider whether the students were only strongly influenced by their reading and studies because what they were reading and studying was in line with their already-held beliefs. It may be that the participants were drawn to reading material that supported their beliefs and ignored material that conflicted with their beliefs, perhaps enabling the participants to deal with the cognitive dissonance that

can arise when presented with information that contradicts one's beliefs (Pajares, 1992).

As well as specific pedagogical views related to technology use, many of the participants also expressed general pedagogical views about what early childhood provision should look like and what is beneficial for young children. These views predominantly highlighted a play-based, experiential curriculum for young children (Kay, 2012; Nutbrown, 2011; Athey, 2007) which appears to result in negative views towards the use of technology:

Cara: *When I see them in nursery, and I see the conversations that they get when they're just playing, I just think they are learning far more from that than I can ever imagine them learning from any form of technology, which doesn't' give them that feedback and the communication and interaction skills that I think are pretty important for early years, really.*

Rosie: *In general [young children] should be playing. They should be hands in the mud, they should be jumping in the muddy puddles, they should be exploring; stuff that we did when we were younger.*

Susan: *I think it's the talking and the interaction and the physicality of being with the two year olds that the two year olds and I need. It's not looking at a screen it's actually digging the soil, it's talking to them, it's using words.*

Therefore, for many of the participants, technology did not fit well with their views of an appropriate pedagogical approach for young children. However, not all participants took this view. A few participants felt that they were able to integrate technology into their play-based experiential approach to early childhood and did not feel that technology was at odds with this pedagogical approach. For example, Alex discussed the continuous provision in his nursery and explained how he felt that technology is just another part of a wide range of activities that should be available for young children to explore:

Alex: *[Technology] is part of our continuous provision, it's always available for them to get and to play with when they want to, some children will go on it daily and some children will go on it rarely… it's not something*

that we necessarily force on them because we wouldn't force any area of our provision on them because of the age they're at. It's up to them what they choose to play with, all we can do is provide the opportunity for them to interact with it.

This idea was also taken up by Julia in her interview in which she discussed the play based nature of the provision in her setting and described how they were able to 'slide' technology into what they were doing in a very natural way. However, it should be noted that in Julia's setting, technology seems to be used in a very interactive way with digital cameras, programmable toys such as Bee Bots or role play equipment such as cash registers being the main types of technology used, which can easily be integrated into everyday play experiences. Very few of the participants discussed the use of active technologies and when talking negatively about how technology does not fit with their pedagogical approach, they often appeared to equate technology with more sedentary screen based activities:

Cara: *We use flour, gloop, all sorts of things to practice writing the letters and the numbers… they have hours of fun just messing with it and practicing their letters and then practicing their numbers and then going back to their letters and back to their numbers and I personally don't think they'd be that engaged by just repeating it over and over on an iPad screen.*

Jess: *I don't use a lot of it because it's not necessary. Why would I be stuck inside, it's not interesting for them. It's too sedentary. My guys, we're in and out, we do lots of different things. They wouldn't find it interesting, that's why I don't understand. It's not interesting to be sat there, it's not stimulating.*

Therefore, it would seem that the participants' views about technology in early childhood were influenced by their own pedagogical beliefs and by what they viewed technology as incorporating.

4.2.2. Practical Considerations

As well as being influenced by their own pedagogical beliefs, many of the participants were also influenced in their views on the use of technology with young children by a range of practical considerations. The first practical consideration

raised by a number of participants was the issue of training. Much of the literature on this topic suggests that one of the key factors that can influence practitioners' views regarding technology is a lack of training (Goktas et al., 2013; Ertmer, et al., 2012; Wachira & Keengwe, 2011; Inan & Lowther, 2010). Practitioners who have had little or no training often have more negative views towards the use of technology, and this would seem to also be reflected in the findings in this study. Felicity, who has been teaching for many years, described getting an Amstrad computer in her classroom many years ago which just sat at the back of the room because no one knew how to use it and no training was provided. This was many years ago when technology was a very new feature in many classrooms, but things do not seem to have changed very much even in recent years. For example, a current lack of training for early childhood practitioners was highlighted by Rosie, who pointed out that many practitioners are just left to work out how to use the technology by themselves and therefore, choose not to use it:

Rosie: *We don't get really taught how to use technology with children, I think it's more your own dealings with technology. I think we've got members of staff in the setting who are technophobes, they won't go near any [technology].*

Many participants also highlighted how a lack of training can result in an activity using technology being unsuccessful, and therefore can put practitioners off using the technology again in the future. For example, Helen described a lesson she observed where the teacher did not know how to use the technology effectively:

Helen: *I guess I'm thinking about one particular lesson that was taught by a teacher that isn't that 'au fait' with technology herself, and by the time she'd got them all switched on, because nobody knew what they were doing, it was time to sign off and put them away. I thought, "Well, what was that about? Nobody's learnt anything by that. They could have gone out and played for 10 minutes."*

Additionally, Alex, who described himself as being very confident in the use of technology, pointed out how important training is for staff in order for them to become comfortable with its use and develop more positive attitudes towards it.

It should be noted that some participants did not feel that just providing some training to practitioners was enough. Karen is a reception teacher in a primary school where in-service training is regularly provided for staff; however, Karen pointed out that this training often takes place after school when teachers are tired and it is often a one-off session, which does not allow teachers to develop the skills they need to feel the confidence that Alex suggested is vital This reflects findings by Broady, Chan, and Caputi (2010), who suggest that particularly for older adults such as Karen, a longer time may be needed to master new skills, and if this is not available, it may contribute to a sense of incompetence and therefore foster negative attitudes towards technology.

A further practical consideration which seems to have influenced the views of many of the participants is the factor of time. Wood et al. (2008) point out in their research that early childhood settings are very busy environments and many practitioners found that they did not have the time to engage with technology. This notion was reflected in the views of a number of the participants in this study. For example, Jess pointed out that she is always so busy doing other things with the children in her setting that she does not have the time to use technology, even if she wanted to. This idea is also echoed by Susan who suggested that in her work with two year olds, even though they have three staff and only eleven children, there is very little time available in the day to engage with technology. However, perhaps this lack of time is more pertinent for settings like Susan's where the children only attend for a few hours each day, and indeed, Susan highlighted that if the children were in her setting for several hours, then maybe technology could be useful to provide the children with some "down time". However, even in Julia's setting where the children are in attendance for a much longer period during the day, Julia indicated that often, technology is the first thing to be forgotten about when things get busy:

Julia: *I think, you know, in our setting there is so much to get through in terms of the curriculum that actually, its technology that normally is the thing that we think, "we'll look at that later", and then we don't always [get back to it]… so you know, the technology side of things sometimes*

comes last in the list of priorities for us because we're ticking all the other boxes first.

Nonetheless, not all participants are in agreement and as Kirsty and Alex both pointed out, the principle of continuous provision in early childhood settings, where a wide range of activities are provided for the children to choose from independently, lends itself to the use of technology. In this approach, technology can simply be provided as part of this continuous provision for those children who are interested, in the same way that any other activity can be chosen freely by the children.

However, Julia highlighted that it is not just about having the time to use the technology with the children, it is also about having the time to support the children when things go wrong with the technology. Julia's setting uses a continuous provision approach but as Julia pointed out, when staff are busy, having the time to help a child who is having difficulty with the technology can be problematic:

Julia: *They can quite often log themselves out on the computer, and if you are sitting [with another child] and they say "can you help with this" and you say "yes, I'll be there in 5 minutes," sometimes you don't get there!*

This links with the next practical consideration which influenced the views of many of the practitioners with regard to using technology with young children. A number of participants pointed out that technology can often go wrong or break down and this can leave practitioners frustrated and having to quickly come up with an alternative plan. For some participants, this was a significantly negative experience and put them off using technology again in the future, reflecting the findings of a number of experts (Wood et al., 2008; Zhao & Frank, 2003):

Julia: *The other thing with technology is it just goes wrong so often and you just think - you have it all lined up and you go to touch the screen and it's not working and everything you have planned... so sometimes it's more trouble than its worth - that's how it feels - sometimes whatever you have planned you have got to have a second plan.*

Helen: *I'm not great at getting myself sorted out [when things go wrong]. I think, partly, because I've got no interest whatsoever in sorting things out. I just want it to work. It's a bit like a car. I want to get in it, turn it on, and it needs to go. I don't have any interest in how it works.*

Even Alex, one of the participants who was the most positive about the use of technology with young children, described the frustration that is felt when things go wrong with the nursery's digital camera which wipes all the photos from the memory if the battery dies. This may be as a result of the nursery's choice of equipment, as modern digital cameras use storage cards which are not affected by the battery; however, this was still a frustrating situation for this participant.

A final practical consideration that was affecting the views of the participants on the use of technology with young children was issues of access to appropriate technology. Parette et al. (2010) suggest that access to technology should no longer be a problem for early childhood settings, as the price of technology has gone down significantly; however, this does not seem to be the case with many of the participants in this study who discuss the lack of technology in their setting and the cost of purchasing appropriate technology for young children. For example, in her interview, Helen talked about the use of iPads and pointed out that her school only has one set of iPads to share across all of the classes, and therefore the amount of use that each teacher can make of them is limited. Some participants identified that there are cheaper versions of some technologies available, for example, cheaper tablet computers than an iPad. However, Alex, who uses a cheaper tablet computer in his setting, discussed how the children found this more difficult to use than an iPad, as it does not have the same intuitive interface as the more expensive tablets. Even among those participants who work in schools where more money is available for technology, the amount of technology in their classrooms is still limited by budget restrictions.

Linked to this is the view of some participants that they do not want young children to access very expensive technology as they might break it:

Karen: *You wouldn't give a small two-year-old, something that costs five or six hundred pounds, would you? You just don't do it. [Whatever you give them to play with], you want them to explore it. You want them to poke it, to shake it, to lick it, to listen to it. It's unnatural for them to just sit there with them. If you give them an iPad, then you get upset when it's covered in fingerprints, or it's been down the back of the high chair, or it's thrown across the room. It just doesn't make sense to me.*

This idea was also reflected by Rosie who commented that giving young children cheaper technology such as interactive toys might be more acceptable, but more expensive technologies such as iPads would not be suitable for very young children.

The expense of keeping up with the latest developments in technology was also discussed by some of the participants. For example, Karen described how, in her school, they have gone through several different periods of technology use which have proven to be very expensive:

Karen: *At first, we had standalone computers, then I noticed that in schools, whole rooms were being given over to IT Suites. Then they were wired into the internet. Within two or three years the [desktop] computers had gone. They had been replaced with laptops, until about four years ago, which would be 2012, we found that the laptops were then considered to be old hat, and people were looking to use iPads. The curriculum had changed, and we were told that ICT was no longer to be taught as a single subject, it had to underpin all the other subjects. The ICT suites, which had been expensive to put in to school, were taken out, and iPads, and some laptops were put in trolleys, and taken across between rooms.*

As well as the accessibility of the technology itself, a number of participants also commented on the accessibility of suitable software for young children. Even Alex, who is very positive about the use of technology with young children, described how many of the Apps they have available for young children are not entirely suitable:

Alex: *A lot of times the apps, they're not necessarily friendly for young children. So verbally the communication isn't ideal, and we've got some that are American so it's difficult for the children to understand because obviously the pronunciation is different.*

Therefore, practical considerations seemed to be partially responsible for many of the negative attitudes of some of the participants, and even those participants who were generally positive about the use of technology with young children were often frustrated by the availability, reliability and expense of technology as well as trying to fit it into a very busy day in an early year setting.

4.2.3. Personal Characteristics

As well as pedagogical beliefs and practical consideration, the views of many of the participants regarding the use of technology with young children were also affected by their personal characteristics.

Much of the literature suggests that there is a correlation between age and attitudes towards technology, with older people having more negative attitudes and younger people having more positive attitudes towards technology use (Czaja et al., 2006; Laguna & Babcock, 1997). Broady et al. (2010) point out that this is a stereotypical view; nonetheless, this pattern was seen in the responses of a number of participants in my study. Firstly, some of the older participants in my study clearly considered their age to be part of why they held more negative attitudes towards technology. For example, Helen, who was one of the older participants in my study, described herself as a 'dinosaur' when talking about her attitudes to technology in the focus group and later, in her interview, when she was again expressing negative views about technology, she described herself as sounding rather 'Victorian'. This idea was also reflected by Felicity in her interview, where she also described herself as Victorian and suggested that her more negative attitude towards technology is because she is older and from a generation who did not use technology when they were growing up. In her focus group, Susan talked about being fifty years old and suggested that as she did not grow up with technology, her attitudes are shaped by her age and the way she is used to doing things from her own childhood and youth. She went on to suggest that when she hears people talking positively about the use of technology with young children, they are predominantly younger teachers in their twenties and not older teachers in

their fifties or sixties. Similarly, Karen talked about her attitude to technology being one of 'take it or leave it.' Karen, who was the oldest participant in the study, suggested that she could happily live without technology because she 'came to it a bit late' and she felt that this had affected her attitude towards technology.

At the other end of the age spectrum, Lucy also attributed her attitudes towards technology partly to her age. Lucy is one of the younger participants in this study and expressed extremely positive attitudes towards technology, which she attributed to having been slowly introduced to technology from a young age. Similarly, another younger participant, Alex, suggested that he had grown up as part of the digital generation, which resulted in his positive view of its use with young children, clearly reflecting the findings in other research which suggests positive attitudes towards technology from younger people (Broady et al., 2010; Teo, 2006)

As well as some of the participants feeling that their age was related to their own attitudes towards technology, a number of participants expressed views that their colleague's ages were responsible for negative attitudes towards technology. For example, Cara whilst trying to be diplomatic, suggested that age is related to technology use and Lucy concurred:

Cara: *We've got quite a few practitioners who are older. I think a few of them are a bit ... I don't necessarily… Well, they just don't know how to use it!*

Lucy: *A lot of older people tend to find it a bit scary. Whereas, I'm like, (speaking excitedly) "Woo, what's this new gadget?"*

However, despite this, not all of the participants in this study fitted into this stereotype. Julia, who was one of the older participants in the study, was also one of the most positive about the use of technology with young children, and this may reflect the fact that Julia has had the 'proper encouragement' and 'clear explanations' required to learn how to use technology effectively (Broady et al., 2010, p. 483).

At the other end of the age spectrum, Rosie, who was the youngest participant of all, expressed extremely negative views about using technology with young children, which appeared to be largely connected to her pedagogical beliefs about best practice for young children.

It would seem then that overall, many of the participants considered their age to be either a barrier or an enabler of their use of technology with young children. However, many of these participants may have been caught up in the stereotype discussed by Broady et al. (2010) that older people are less able to use technology effectively. It was interesting to note that although a number of the participants, particularly the older participants in the study, considered their age to be a barrier to their use of technology with young children and expressed the belief that their age had resulted in their negative views regarding technology, this may be more related to the participants' perceptions of, rather than the reality of their use of technology. Many of these older participants had quite high levels of personal skills in using technology but despite this, were caught up in the stereotype of age in relation to technology use. Therefore, age alone was not responsible for the participants' attitudes; however, linked to age is the second personal characteristic that seemed to affect the participants' attitudes towards technology – personal skills and interest.

Many of the participants who viewed technology in a positive way appeared to also have high levels of personal skills in using it. For example, Alex who was one of the most enthusiastic users of technology in an early childhood setting, talked in his interview about his current task of building a website for his nursery, and described some quite sophisticated skills which he was developing. Interestingly, these skills were largely self-taught, and Alex described how he was able to take skills he had already acquired and apply them to new situations and technologies. Tsantis, Bewick, and Thouvenelle (2003) discuss how this self-taught use of technology, where teachers are left to fend for themselves in developing technological skills, can leave teachers feeling extended beyond their ability, resulting in many giving up on the use of technology altogether. However, this did not seem to be the case

with Alex, who relished the challenge of teaching himself new technological skills. Similarly, Lucy, who was also an enthusiastic user of technology in early childhood settings, described herself as having a high level of skills in using technology, and linked this to having used technology for most of her life, so using it was natural to her.

A positive attitude to technology was not always linked to skills. Julia, who was also extremely positive about the use of technology in early childhood settings, did not feel that she had many skills in using technology herself. However, despite her lack of skills, Julia has learned to use the active technologies in her setting, such as the Bee Bot and digital camera, which may reflect the findings of Bullock (2004) who suggests that even teachers who are negative towards technology can change their ideas if they are supported by a mentor who uses technology enthusiastically, which is the case for Julia. On the other hand, Felicity described her own personal skills in using technology to be quite high and described her ability to use technology at quite an advanced level; nonetheless, Felicity was one of the participants who was most negative about the use of technology in an early childhood setting.

Many of the participants who viewed technology in a negative way described their lack of skills in using technology, which reflects the findings of Tsantis et al. (2003) who also found that many teachers lacked the skills to use technology effectively which resulted in concern and negative attitudes on the part of the teachers. For example, in her focus group, Karen talked about one of her colleagues who uses technology extensively and has recently been using twitter with the children to communicate with children in a school in Canada. However, much as she found this interesting, she commented that she did not have the skills to do anything like this herself:

Karen: *The sophistication needed to do that isn't within the remit of the primary school teacher who has been trained in the normal way. That is an IT specialist.*

Similarly, Susan also commented on not having the skills to use technology with the

children. This was interesting, as before beginning to work in early childhood, Susan had worked in publishing and had used a computer extensively for her job. When I asked her about this she commented that through her work she had learned how to carry out a range of tasks using a computer but could not go beyond those skills she had originally learned, and did not apply them to working with children. It appears the skills had been learned in isolation, and for a specific purpose, and therefore were not transferred to work with children. However, in her focus group, Susan commented that she probably could learn how to transfer her previously learned skills to using technology in the early childhood classroom but stated that she was just not interested, indicating the link between the development of skills and the need to have an interest in technology:

Susan: *If I were interested and wanted to use that sort of thing all the time I would probably have no problem integrating it into the classroom.*

In addition, other negative views regarding technology use in early childhood seemed to be influenced by the participants comparing their lack of skills with technology to the children's competence with technology, reflecting the views of Tsantis et al. (2003). This disjuncture between what they could do and what the children could do made some of the participants feel anxious, as Carol suggested in her focus group:

Carol: *The thing is, they are far in advance of where we are, I always feel that I am constantly playing catch up.*

Therefore, it would seem that personal skills and interests in using technology had influenced the attitudes of some of the participants but others had risen to the challenge and even though they felt they lacked the skills to use technology, they had learned enough to use it effectively with the children.

4.2.4. Personal Experiences

Along with pedagogical beliefs, practical considerations and personal characteristics, a further theme arising from this research suggests that personal

experiences with technology have a significant impact on the practitioners' attitudes towards technology.

Many of the participants who expressed positive attitudes towards the use of technology with young children talked about their own positive experiences of using technology as either an adult or a child, reflecting the findings of Kennedy, Judd, Churchward, Gray, and Krause (2008). For example, Lucy, who was extremely positive about technology use by young children, spoke at length, and very fondly, about her experiences as a child, playing with her father and her brother on a games console. She described the many 'happy hours' they spent together and it would seem that it was the family participation in the games which made this a particularly positive experience for Lucy. Now, as an adult, Lucy is carrying on this love of gaming with her own children and she described how her whole family has enjoyed playing a new computer game together over the Christmas holidays. When questioned about the link between her childhood experiences of technology and her current positive outlook on the use of technology with young children, Lucy confirmed that this had played a major role in her positive attitudes:

Lucy: *That's probably why I have a positive outlook on technology for children because most of my experiences have been positive.*

Not all participants who had positive childhood experiences of technology carried these positive views into their current attitude towards technology use by young children. For example, Felicity who was one of the most negative participants in relation to using technology with young children, discussed in her interview a range of positive childhood experiences of using technology. She described how technology had made a significant difference to a time in her childhood when she had been in hospital and had to lie flat on her back for eight weeks. Felicity was able to use technology to entertain herself and to prevent boredom during this difficult time in her life. However, this may be part of the reason for Felicity's negative view about using technology with young children, as she may view technology more as a form of entertainment and as something to ward off boredom. Indeed, in her interview, Felicity spoke of her concerns that technology

was being used as a digital babysitter in order to keep children quiet and entertained, rather than as a learning opportunity.

Similarly, a number of participants who had experienced technology in a negative way in the past expressed negative views about using it with young children. For example, Cara described her childhood disappointment with technology when it did not work in the way that she expected. In addition, Rosie who was particularly negative about the use of technology with young children, described her frustration in the past when trying to get technology to work and failing, particularly when related to issues of saving and printing work and finding that it had not saved and would not print. Both Cara and Rosie were some of the younger participants in this study, but this notion of negative past experiences was particularly prevalent among the older participants in the study and may be related to early experiences of technology, before it had advanced to the level it is at today. For example, both Karen and Susan, who were the oldest participants in my study, discussed using computers back in the 1980s when they were very new, and described how they found them to be frustrating and complicated. Karen described her first experience with a computer in 1981:

Karen: *In 1981 we did buy a ZX81, which was the Sinclair first home computer, that you had to plug in to the back of your television, and it took forever to program a straight line. After a couple of days we got fed up, so we took it back and got our money back.*

Similarly, Susan described an early experience of using computers when she was at school and how she failed to be able to programme it to draw a straight line:

Interviewer: *Did it bother you that you couldn't do it?*

Susan: *It did because I failed and I couldn't do it, and it didn't give me a good experience of computers to start off with.*

Therefore, past experiences with technology appear to be significant in shaping the current views of many of the participants in the study. However, whilst personal experiences with technology in the past appear to have been partly responsible for

the participants' current views on technology, the most significant personal experience that appears to be influencing their attitudes is their own more recent personal experiences with technology in their own families and particularly with their own children.

Firstly, in line with Turkle (2011), many participants described how they felt that technology was having a negative effect on their family lives, and was responsible for disrupting family time together. This idea was reflected by Karen who suggested that family time was becoming less and less common as, "children are gravitating towards their own tablets, and their own computers, in their own rooms." Both Felicity and Julia described how their teenage children are using technology almost constantly, which interferes with family time together. Felicity even went so far as to insist that her children leave their phones in another room when they were having family night to ensure that technology was not disrupting their time as a family. The strength of Felicity's and Julia's views can be seen in their response in the focus groups:

Felicity: *Our children text and talk but we extract them now when we are watching a family movie. If we watch a family movie then we are watching a family movie and you put those damn things away because otherwise it's watching the family movie with everyone on their iPhones.*

Julia: *Personally, I object to the intrusion into our family life and the Instagram thing and the Snapchat drives me mad already because quite often, they will look for their phone first thing in the morning and I think, "Well, what do you need to know? Why do you need to know what your friends have done overnight...? You know, it's 7:00 in the morning." We do limit that. We do limit that because I just think it's an intrusion into family life.*

In her interview, Julia went on to describe a recent holiday her family had taken where her daughters were more interested in checking their phones to see where their friends were, than they were in the things they were doing together as a family.

Felicity took this theme further and described how the use of technology can alter her children's moods and therefore impact negatively on their time together as a family, resonating with the findings of Oldmeadow, Quinn, and Kowert (2013) and Lanigan (2009):

Felicity: *You can have a child who's in a very good mood but then through social media and going on something that somebody else has said, they then turn into a very aggressive child, which has nothing to do with you but it completely wrecks your evening and your family time because they're in a foul mood or they're really upset about something that's going on through social media. Whereas if that didn't exist in the past, they wouldn't have known about that until the next day at school.*

It just becomes all-consuming and then they feel they've got to stay on the phone so that they can find out what's going on with this particular incident all through the night.

Jess also felt that technology was having a negative impact on her family life and described her dissatisfaction at how technology had changed the way her family communicates with each other. She commented that rather than talking to each other as they used to do, they now text and speak to each other using social media. This idea was also reflected by Karen who also pointed out that family conversations are suffering as a result of technology taking over children's lives, reflecting the findings of Subrahmanyam, Kraut, Greenfield, and Gross (2000). Therefore, many of the participants had experienced this disruption to family life caused by technology and viewed it in a negative way.

As well as the idea that technology is disrupting family life, a number of participants discussed how technology was causing conflict within their families. Taylor, in her focus group, talked of the conflict caused in her family by the computer game 'Minecraft' and explained that trying to get her son to do anything other than play the game has become a challenge for her:

Taylor: *Before the age of seven he used to be very much outdoors, very active, always had gymnastics, swimming, dance class, theatre school, you name it he's been doing it, but at the moment all he wants to do is sit*

on Minecraft to the point where, if its gymnastics tonight, the fight that I have to get him to go, just because he wants to sit and play.

Similarly, Karen and Susan both described conflicts that arose from attempting to limit the amount of time their children spent playing computer games, reflecting the ideas of Potter (2016).

Felicity's concerns were similar, but rather than relating to computer gaming, she described the conflict that arises in her family when she tries to limit the amount of time her children spend using social networks such as Facebook, Instagram, Twitter and Snapchat:

Felicity: *When you try and take your child off that equipment, they're angry and they're cross and it doesn't help your relationship with your child as a parent.*

Finally, Julia described an incident that occurred the previous week in her family where her two teenage daughters nearly set fire to their house by doing something silly which they had read about online. When Julia challenged them about the common sense of what they had done, they replied, 'Well, it must be alright because we saw it on the internet.' This assumption that what is on the internet must be correct deeply concerned Julia and has been making her rethink her attitude towards her own children's use of technology:

Julia: *That was a real wake-up call for my husband and I because we both sat back and said, "I would never have expected that to happen to us," because we thought we were on it. Yeah, so my experience of technology now is monitoring what two 13-year-old girls do on it.*

Therefore, these personal experiences of technology within in their own families and particularly with their own children appear to have significantly affected the views of a number of the participants regarding the use of technology with young children.

It would appear that a wide range of factors have impacted on the participants' views regarding technology use by young children. Their own pedagogical beliefs about the nature of early childhood, and specifically regarding the sorts of activities that are appropriate for young children, seem to be particularly influential, along with a number of practical issues such as the lack of training available and the lack of time in a busy early childhood setting to engage with technology. Additionally, practical considerations relating to sorting out technical problems with technology also seem to have a negative influence on the participants' attitudes. As well as these pedagogical and practical issues, the participants were also influenced by their personal characteristics such as their level of personal skills in using technology and finally, by their own personal experiences of using technology, both in the past and in the present with their own children and families.

This study aimed to address two research questions:

1. What views do early childhood practitioners hold regarding the use of technology with and by young children?
2. What factors have influenced the views of early childhood practitioners regarding the use of technology with and by young children?

This chapter has presented the findings of this study in relation to these two research questions; however, the following chapter will now discuss these findings in relation to a range of theoretical perspectives on the use of technology and also, on the factors that influence the development of belief systems.

Chapter 5 Discussion

The findings in this study would suggest that the attitudes of early childhood practitioners regarding the use of technology with young children are complex. Ertmer (1999) proposes two types of barriers which interact to affect practitioners' attitudes towards the use of technology in their settings. Firstly, first order extrinsic barriers such as lack of time, resources or appropriate training and professional development were proposed as having a significant impact on attitudes towards technology and secondly, second order intrinsic barriers such as practitioners' pedagogical beliefs and the perceived value of technology for supporting learning were highlighted as being extremely influential in determining practitioners' attitudes towards technology. This study by Ertmer (1999) was carried out in schools, with teachers of older children; however, in my study of early childhood practitioners, many of whom work in the private and voluntary sector with children below school age, the same barriers and attitudes existed. This chapter will begin by discussing and analysing the first order, extrinsic factors that appeared to affect the attitudes of the participants in my study towards the use of technology with young children and will then go on to examine the key second order, intrinsic factor which appeared to influence the participants, that of personal beliefs.

5.1. Extrinsic Factors Affecting Attitudes towards Technology

Whilst Blackwell et al. (2014) propose that first order, extrinsic factors affecting attitudes towards technology, are now less common, my study found that such factors still played a significant role among the participants.

5.1.1. Cost

The first extrinsic factor which played a part in the development of attitudes towards technology was that of cost. Many of the participants in the study raised the issue of the cost of technology, particularly those participants who work in the private, voluntary and independent (PVI) early childhood sector. Parette et al. (2010) propose:

> No longer can we hide behind barriers of… a lack of fiscal resources. While these can be challenges, there are certainly ways to overcome these challenges through grant-writing, collaborations with local agencies, and donations of equipment that can turn challenges into opportunities (p.338).

However, it would seem that the things that Parette et al. (2010) are suggesting that early childhood settings could do in order to overcome the challenge of cost are perhaps more accessible to teachers working in the maintained sector, rather than early childhood practitioners in the PVI sector. Tomlin (2008) suggests that every year, millions of dollars of grant money in the USA goes unclaimed because early childhood settings do not know or understand how to apply for them. Whilst this research comes from the USA, it could be assumed that a similar situation exists in the UK. Indeed, a number of grant awarding bodies exist in the UK; however, none of the practitioners in my study made any mention of these and simply expressed the view that technology was too expensive for their setting to afford.

Parette et al. (2010) also suggest that the cost of technology can be overcome by encouraging donations of equipment; however, donated equipment is usually second hand and is generally being disposed of because it has become technologically obsolete, therefore such donations may not prove to be useful for early childhood settings. Indeed, a number of participants in my study discussed negative attitudes related to out of date technology, suggesting that donated technology may not help change the views of these early childhood practitioners. Additionally, in my study, the value of active technologies such as electronic toys, for example the Bee Bot, was discussed by a number of participants; however this type of technology is usually only purchased by early childhood and educational settings and is extremely unlikely to be donated.

Some participants in my study discussed the option of buying cheaper versions of some technology; for example, Alex uses a less expensive tablet computer in his setting. However, it was pointed out that these cheaper versions of technology are

often not as user-friendly as the more expensive version, particularly for young children. A number of participants discussed the benefits of using an Apple iPad but noted that these cost several hundred pounds and are therefore outside of the ability of a PVI early childhood setting to purchase. Some participants in my study described how their settings did purchase one iPad for the setting; however, this tended to be used by the staff for purposes of record keeping, and as Karen pointed out in her interview, she would not be prepared to allow a young child to use such an expensive piece of technology.

5.1.2. Time

Another important extrinsic factor that seemed to significantly impact on the participants in my study is the factor of time. Many of the participants expressed views in line with Wood et al. (2008), who propose that due to the extremely busy nature of early childhood settings, many practitioners do not feel that they have time to engage with technology. This idea was reflected in my study by practitioners who work across a range of different settings both maintained and private, and also with children across the full age range of the Early Years Foundation Stage. However, those participants whose settings operate a continuous provision approach were more open to technology as they could see how the technology was just another part of what was on offer for the children to select from and did not take up any additional time on the part of the practitioner. Even in settings where continuous provision was used as a pedagogical approach, a number of participants felt that children should not be using technology unsupervised and as they did not have the time to supervise the use of technology, did not include it in their continuous provision.

5.1.3. Training

The issue of training appears significantly in the literature on attitudes towards technology (Goktas et al., 2013; Wachira & Keengwe, 2011; Inan & Lowther, 2010; Ertmer, 1999) and in my study, this appeared to be the key extrinsic factor raised by participants. Many practitioners described their lack of skills in using technology

and those in the PVI sector appeared to have least access to appropriate training. Again, this may have a link with cost as many settings in the PVI sector have a very limited budget for staff training and may not use it for training staff in the use of technology (Sadek & Sadek, 2009). This is particularly the case if their belief is that technology is not valuable to children in early childhood, which will be discussed in more detail later in this chapter. Even participants who worked in settings where training was provided did not always feel that this training met their needs. Julia, who works in a maintained setting, has had informal training from her colleagues and they appear to work together to try and understand how the technology works and how they can integrate it into their setting. However, Karen, who also works in a maintained setting, has experienced formal training, which was so far beyond her current level of expertise that it was only effective in persuading her that technology was too difficult for her to use. This training was also a one-off event which did not allow for skills to develop and was conducted at the end of a school day, when staff were tired and just wanted to go home. Karen commented that the sorts of things that were being proposed in her school were not the sorts of things that she would have the technological skills to undertake, but as she suggested, are really the domain of an IT specialist.

Therefore, despite suggestions from Blackwell et al. (2014), it would appear that extrinsic factors still have a significant influence on shaping the attitudes of early childhood practitioners to the use of technology with young children. However, as Ertmer (1999) proposes, it is the second order, intrinsic factors that seem to have the greatest impact on practitioners' attitudes.

5.2. Intrinsic Factors Affecting Attitudes towards Technology

Pajares (1992, p. 307) suggests that 'few would argue that the beliefs teachers hold influence their perceptions and judgments, which, in turn, affect their behavior in the classroom,' and this would seem to be significant in my study. Indeed, the beliefs that the participants held regarding life, the nature of early childhood, education in general, and technology in particular all had a significant influence on

their attitudes towards technology use in early childhood settings. However, these beliefs were not simple and whilst some literature suggests that these beliefs fall into two very separate 'for' and 'against' camps (House, 2012; Plowman, McPake, & Stephen, 2010; Abbs et al., 2006; Cordes & Miller, 2000), my study highlighted a third perspective which demonstrated the very nuanced beliefs held by many of the participants. In this perspective, many of the participants were neither fully in favour of, nor fully against, technology use in early childhood settings; instead, they were both for and against technology, depending on a number of characteristics. These characteristics included the age of the child, the duration of the technology use, the type of technology being used and whether or not the technology was being used in a solitary or social way. The participants were more in favour of active technologies such as Bee Bots and digital cameras and when these technologies were being used by children over the age of three or four, for short periods of time and with small groups of children working together, the participants' attitudes were more likely to be positive. However, when screen based technologies such as computers and televisions were being used, or if the technology was being used by very young children, for an extended period of time or if the child was using the technology in a very solitary or unsupervised way, then the participants' attitudes were more likely to be negative.

While the first main research question for this study was to identify the views that early childhood practitioners held regarding technology use with young children, the second research question was to try and understand why such views had developed. Getting to the heart of practitioners' beliefs can be complex (Kim & Han, 2015; Rubie-Davies, Flint, & McDonald, 2012; Pajares, 1992) and a thorough analysis of the factors which shape belief systems would not be possible within the space allowed for this study. Indeed, within the psychology community, the study of the formation of beliefs is an area of significant research and disagreement. However, this study takes the position that beliefs are socially constructed and therefore, the work of Nespor (1987) and Rokeach (1968) have both assisted me in understanding the factors that have influenced the beliefs of the participants in my study.

Rokeach (1968) points out that asking practitioners to describe or explain their beliefs is fraught with difficulty, as many cannot articulate what or why they believe the way they do. Instead, the most effective way to understand beliefs is to make inferences from the things that practitioners say and do, without directly questioning them about specific beliefs. Indeed, as Pajares (1992) suggests, the key to a successful study of attitudes and beliefs is in relation to the researcher's ability to make inferences from the data. As a result, I recognise that my inferences about the beliefs of the participants in my study are subjective and based on my interpretation of the things they said. Whilst I made every effort to try to understand their individual beliefs, particularly through the interview phase, by attempting to clarify and confirm with the participants the meanings behind what they said, ultimately, this analysis is based on my inferences.

5.2.1. Existential Presumptions

Nespor (1987) proposes that the first characteristic factor affecting belief is existential presumption. Existential presumptions are often considered to be related to big-picture beliefs such as in the existence of God; however, Nespor (1987, p. 318) proposes that in reality, such beliefs can also be in relation to much more 'mundane' areas, such as teachers' beliefs about the nature of learning or pedagogical approaches. Within my research, existential presumptions played a significant part in the beliefs of the participants. Rokeach (1968, p. 113) purports that beliefs run on a 'central-peripheral' axis, with some beliefs being at the heart of a person's belief system whilst others are more peripheral to the belief system. Those beliefs at the heart of the belief system are the strongest and most resistant to change and this would appear to be the case in my study. Two existential presumptions appeared regularly in my interviews and focus groups, one in relation to the most appropriate pedagogical approach to take with young children, and the other in relation to the nature and importance of family life. Both of these would be classed by Rokeach (1968) as 'central' beliefs and therefore particularly significant and resistant to change.

Pedagogy in early childhood can be a contentious issue with many different pedagogical approaches proposed (Siraj-Blatchford, 2010; Stephen, 2010). Bernstein (1996) suggests that pedagogy has two dimensions; classification and framing. Classification refers to the separation or integration of subjects: when subjects are treated very separately, then classification is strong, and when subjects are integrated then classification is weak. Framing, on the other hand, refers to the degree of control exercised by the teacher. When the teacher takes control, of the children's learning, then framing is strong, but when control of the learning rests with the child, then framing is weak. The participants in my study had a range of pedagogical approaches. Generally, as is predominantly the case in early childhood settings, their classification was weak with a very integrated approach taken to curriculum. However, whilst a homogenous view on classification existed among the participants, framing varied between participants, with some supporting a child led pedagogy thus a weak framing, and others upholding a strongly framed, adult led pedagogy. This pedagogical belief appeared to significantly influence the participants' attitudes towards technology. Those participants who worked in settings that had a more adult-led approach with strong framing tended to be more in favour of technology in their settings, whereas those who took a very child-centred, weakly framed pedagogical approach were more likely to have negative views regarding technology in their settings. These participants appeared to feel that adult support was required for technology to be used effectively in early childhood settings and therefore, because they did not support an adult led approach, technology did not fit with their pedagogical beliefs. However, one notable participant does not fit with this theory. Alex was the participant most positive about the use of technology with young children but works in a very child-led setting where both classification and framing are weak. Nonetheless, Alex believed that this weak framing actually enabled technology to fit successfully into his setting, as technology simply became part of the continuous provision offered and was always available for the children to engage with if they chose, in the same way that any other activity was available for children to freely choose from.

Pajares (1992, p. 326) makes the assumption that 'belief substructures, such as educational beliefs, must be understood in terms of their connections, not only to each other, but also to other, perhaps more central, beliefs in the system' and it was one of these more central beliefs that appears to have significantly influenced the participants in my study. Whilst this piece of research was predominantly concerned with early childhood practitioners' attitudes towards technology in early childhood settings, it appeared to be impossible for the majority of the practitioners to separate their views of technology use in the home, from technology use in the setting, and as a result, a second existential presumption (Nespor, 1987) influenced their beliefs on the use of technology with young children. Many of the participants in my study had their own children, and throughout the interviews and focus groups, an existential presumption regarding the importance and value of family life became apparent. The importance of families spending quality time together was highlighted by many of the participants, for example, Felicity discussed the value of family nights with her children where the whole family got together to do an activity. This notion was echoed by other participants and extended to discussions around the value of families spending quality time together on holiday as well as on a more regular basis while at home. The overwhelming belief expressed by these participants was that technology was interfering with family life in a negative way and was disrupting quality time together, reflecting the ideas of Kubey and Csikszentmihalyi (1990) and Bruni & Stanca (2008). Indeed, many of the participants described the struggles they faced with their own children in order to get them to stop using technology and to engage with other family activities. These struggles were so acute that they significantly influenced the practitioners' beliefs about technology in a negative way.

One participant was a notable exception to this. Lucy, in her interview, described how technology was actually assisting her family to spend more quality time together as they all enjoyed playing video games and would often have family video game nights, where parents and children would all compete against each other. Lucy spoke very fondly of these experiences and related them to very positive memories which she had of playing video games with her own father when she was

younger. So, rather than believing that technology was interfering with family life, Lucy believed that technology was supporting the development of a cohesive family unit, reflecting the ideas of Osmanovic and Pecchioni (2016, p. 130) who conclude in their study that 'sharing in video games does foster relationships and connections while producing positive emotions for both generations.' However, Lucy was very much the exception within this study among those participants who has children of their own, and the overwhelming belief among this group was that technology was having a negative influence on their family life and therefore resulted in a more generally negative view regarding technology.

5.2.2. Alternativity Beliefs

The second factor which may have influenced the beliefs of the participants in my study is the idea of alternativity. Alternativity beliefs are made up of 'conceptualizations of ideal situations differing significantly from present realities' (Nespor, 1987, p. 319). In relation to education, teachers or practitioners may have a utopian view of what they would like their setting to be like, which influences their beliefs about the sort of educational experiences they provide for the children. Many participants in my study mentioned their own childhoods, in which there was very little technology, and often seemed to view this as a utopian ideal for early childhood. Indeed, as Rosie suggested, young children should be doing 'stuff that we did when we were younger.' In addition, many participants who had been teaching or working with young children for very many years also had memories of their early days of teaching in classrooms without technology, which appeared to be much happier than their current situations. Many of the participants expressed clear preferences for traditional early childhood activities such as baking, playing board games, doing jigsaws, playing outside, digging in the mud, reading books, playing with blocks, engaging in role play and singing nursery rhymes, none of which required the use of technology, and it was this more traditional approach to early childhood that many participants saw as a utopian ideal. A number of participants were also determined to preserve this more traditional approach to early childhood within their settings, as they perceived children's home lives to be dominated by

technology. The juxtaposition of the utopian, technology-free early childhood setting against the technologically-crowded home environment was made by a number of participants.

As well as ideas about a utopian early childhood setting, a number of the participants also expressed utopian ideals about the nature of childhood. These ideals often reflected views expressed in the literature (Palmer, 2006; Elkind, 2001; Postman, 1983) which highlight the ways in which the authors feel that young children's innocence and naivety are being affected by technology. Indeed, the unsuitable nature of a lot of what they perceived young children to be able to access online was a major area of concern for many participants. This appears to have strengthened the negative beliefs about technology and the ideals of an alternative, technology-free approach to early childhood practice which were held by some of the participants.

However, Buckingham (2000) proposes that, to many people, technology can offer a form of 'visionary utopianism' (p.44) where education can be fundamentally changed and where technology can offer new methods of teaching and learning which would not be possible using traditional teaching methods. Whilst this idea may have been supported by a few participants in my study, particularly Alex and Lucy, who both highlighted many positive educational benefits of technology, the majority of participants did not view technology as providing this visionary utopianism but rather, saw their more traditional approaches to early childhood education as the utopian ideal. Indeed, a number of participants pointed out how they believed that their more traditional approaches to early childhood education were far superior to anything that technology could offer, particularly in relation to the proposition by Plowman and McPake (2013, p. 30) that 'technological interactivity is meagre compared to human interaction.'

5.2.3. Affective and Evaluative Loading

The third factor which may have influenced the beliefs of the participants in my study is the idea of affective and evaluative loading (Nespor, 1987). This notion proposes that feelings play a significant role in the formation of beliefs, and if people feel positively about something, it will affect their beliefs in a positive way but if they feel negatively towards something, it will affect their beliefs in a more negative way. As discussed earlier in this chapter, the feelings of the participants in my study towards technology use with young children were more nuanced than simply being positive or negative. A wide range of 'it depends on…' views were proposed with regards to technology use, and a number of both positive and negative feelings were expressed in relation to technology.

However, one area where strong negative feelings were expressed by the majority of the participants was in relation to the ways in which technology was being used, predominantly in the home environment, but also, occasionally in the early childhood setting. Rather than technology being used purposively to support young children's learning and development, almost every participant used some variant of the term 'digital babysitter' or 'electronic babysitter' to express negative feelings about technology. Many participants reflected findings in the literature by being deeply concerned that young children were being given technological devices as a way of keeping them entertained and occupied while their parents did other things (Beyens & Eggermont, 2014; Rideout et al., 2003). As some participants noted, parents have always employed methods to keep their children occupied while they do necessary household tasks, for example, Karen described the use of a playpen for such times; however, a number of participants highlighted that whilst they understood the need for parents to keep their children occupied at key points in the day, what concerned them was the length of time children were being occupied by technology. Several participants talked about needing five minutes peace now and again and considered technology to be acceptable for that, but as Jess pointed out in her interview, five minutes can turn into twenty minutes very easily and Helen highlighted how it could be very tempting to leave the child for a much longer

period, which is what many of the participants perceived was happening in many homes.

In addition to technology being used as a digital babysitter in the home, a number of participants pointed out that it was also being used in a similar way in some early childhood settings. For example, some participants described negative feelings about how technology was being used by some practitioners to keep children out of trouble and by others to allow the teacher to get on with classroom jobs such as tidying up or marking work. None of the participants saw this as an effective use of technology and it led to negative feelings about technology which, as a result of affective and evaluative loading, reinforced negative beliefs about the use of technology with young children.

Pajares (1992) proposes that beliefs that have an affective and evaluative element are extremely resistant to change as they are stronger than knowledge. This idea can be seen in my study where a number of the participants, particularly those in the maintained sector, had experienced training in how to use technology with young children in their classrooms. However, despite the increase in their knowledge about the use of technology, the strength of their negative feelings and therefore the strength of the affective and evaluative loading meant that they held firm to their more negative view of technology, reflecting the propositions in some of the literature on the topic (Talbot & Campbell, 2014; Shinde & Karekatti, 2012).

However, for one participant, training did appear to support a shift in her views about technology from being more negative to being more positive. This participant has experienced informal peer supported training in her workplace and had also completed a module at master's degree level on technology in early childhood and felt that this training had opened her eyes to the nature of technology. Before undertaking this training, she had viewed technology as mainly consisting of screen-based equipment; however, this training had introduced her to a range of active technologies such as Bee Bots, digital cameras, digital microscopes, electronic toys and voice recording equipment such as easi-speak

microphones, which had all made her feel more positive about the use of technology. In spite of this, this change in attitude towards technology may not constitute a great change in beliefs. This participant had expressed a strong existential presumption about the nature of learning and appropriate pedagogical approaches for early childhood, which were predominantly play based and active, and therefore, these active technologies were able to be easily subsumed into her existential presumption about learning which is the strongest determinant of belief (Pajares, 1992; Nespor, 1987; Rokeach, 1968). However, her generally negative beliefs regarding screen based technologies remained intact.

5.2.4. The Episodic Nature of the Development of Beliefs

The final factor which may have influenced the beliefs of the participants in my study is the episodic nature of the development of beliefs (Nespor, 1987). This idea proposes that specific episodes or events in life can have a significant influence on beliefs, and as Nespor (1987) notes, many beliefs are deeply rooted in past experiences. This would certainly appear to be the case in my study where many of the participants discussed past experiences with technology as being particularly significant to them, particularly if the episode or experience had been when they were much younger, which reflects the presumption that beliefs are formed early in life (Pajares, 1992).

A number of participants had very positive past experiences with technology. For example, as previously discussed, Lucy had very positive experiences of playing video games with her father when she was a child. Playing together made her feel special, and thus produced a very positive impression of technology. However, in the same way, negative past experiences of technology resulted in a number of participants having very negative views about technology use with young children, reflecting the ideas presented in the literature (Kim & Han, 2015; Sakellariou & Rentzou, 2012; Calderhead & Robson, 1991). A number of these participants were of the age where their first experiences of technology were at a time when technology was quite new and was therefore much more complex to operate than

more modern technologies. For example, one participant described how her school got an Amstrad computer in the early days of technology, but no one could work out how to use it or what to do with it so it was just left sitting at the back of the classroom. Two participants, each in their separate interviews, described attempting to programme an early computer to draw a straight line. For both of these participants this was a particularly negative experience as they could not get it to work. One participant ended up taking the computer back for a refund and the other participant continued to have feelings of inadequacy, and suggested that this experience significantly coloured her view of technology. Even with more modern technology, one of the younger participants in the study expressed her disappointment as a child, when a cheap piece of technology that she had bought did not live up to her expectations. Additionally, negative experiences with modern technology when it broke down also resulted in more negative views of technology.

However, whilst these experiences in their past did appear to significantly affect the beliefs of the participants in my study, it was more recent experiences, and particularly experiences with their own children, that seemed to have the greatest impact on their beliefs. Many of the participants described the struggles they had with their own children to make them put technology away and do something different, and this ongoing struggle, along with the conflicts which often arose as a result, significantly coloured the beliefs of many of the participants. Specific experiences where technology had caused a problem with one of their children were frequently discussed and appeared to be very significant.

Therefore, as Pajares (1992, p. 325) proposes, 'the potent affective, evaluative, and episodic nature of beliefs makes them a filter through which new phenomena are interpreted.' In the case of the participants in my research, their current beliefs about technology use with young children were significantly influenced, not only by their existential presumptions and utopian ideals about early childhood but also by their personal feelings, which have been brought about largely by personal experiences and significant episodes in their distant or more recent past. In the

final chapter, I will reflect on this more fully and discuss the implications for policy and practice.

Chapter 6 Conclusion

This study has attempted to understand two key questions:

1. What views do early childhood practitioners hold regarding the use of technology with and by young children?
2. What factors have influenced the views of early childhood practitioners regarding the use of technology with and by young children?

In this concluding chapter I will offer a brief summary of the main findings from the study and I will then go on to discuss the implications of these findings for the early childhood sector. I will conclude the chapter by reflecting on the way in which the study was carried out and discussing the limitations of the study as well as suggesting areas for further research.

6.1. Summary of Findings

The first aim of this study was to understand the various attitudes that exist among early childhood practitioners regarding the use of technology with and by young children. These attitudes were far more nuanced than I had expected and than the literature has proposed, and whilst strong opinions were expressed by some participants, which were either extremely positive about the use of technology with young children or extremely negative about its use, a third category of attitudes appeared which were not simply positive or negative, but which demonstrated the complex nature of this debate.

This category of attitudes, which I have called 'it all depends…', was far more nuanced than that suggested by the literature and indicated that the participants in this study held predominantly mixed views about technology, depending on a range of factors. These factors included the age of the child, the duration of the technology use, the type of technology being used and whether or not the technology was being used in a solitary or social way. The participants were more in favour of active technologies such as Bee Bots and digital cameras and when

these technologies were being used by children over the age of three or four, for short periods of time and with small groups of children working together, the participants' attitudes were more likely to be positive. However, when screen based technologies such as computers and televisions were being used, or if the technology was being used by very young children, for an extended period of time or if the child was using the technology in a very solitary or unsupervised way, then the participants' attitudes were more likely to be negative.

The second aim of this study was to attempt to understand why early childhood practitioners hold these views and to theorise as to how and why these views have emerged and developed. In line with the findings of Ertmer (1999) in relation to teachers of older children, this study proposes that the same factors also influence those who work with much younger children in the Early Years Foundation Stage. Both first order extrinsic factors and second order intrinsic factors were identified as influencing the views of the participants. First order extrinsic factors such as cost, time, training and support all influenced the participants' attitudes towards technology; however, it was the second order, intrinsic factors which appeared to be most significant.

As Pajares (1992) proposes, the beliefs that teachers hold about education significantly influence their attitudes, and this would appear to be a very significant factor in this study. In line with the findings of Nespor (1987), the beliefs of the participants in this study were significantly influenced by existential presumptions, which included their beliefs about appropriate pedagogy for early childhood and also beliefs about the nature and value of family life. In addition to existential presumptions, the participants' beliefs were also influenced by views of an ideal or utopian early childhood setting, which were often influenced by their own memories of a childhood without technology or an early teaching career before technology use became widespread. The participants' feelings about technology, both positive and negative, also affected their beliefs regarding its suitability for early childhood and finally, their beliefs were influenced by specific episodes in their lives where they had experienced technology in either a very positive or very

negative way. These experiences were particularly influential when they involved their own children and families.

6.2. Implications

Whilst this study was only a small-scale study involving a small number of participants, the weaknesses of which will be discussed later in this chapter, a number of implications for research, policy and practice can be seen.

6.2.1. Implications for Research

Much research into attitudes towards technology among teachers has focused on first order barriers, and those which have examined second order barriers such as beliefs have mainly considered beliefs about technology itself. In this study, the most significant factor which influenced the participants' attitudes towards technology was their personal beliefs, not just regarding technology, but also involving the ways in which they perceived technology to be impacting on many of their other key beliefs, particularly regarding family life. Rokeach (1968, p. 113) purports that beliefs run on a 'central-peripheral' axis with some beliefs being at the heart of a person's belief system whilst others are more peripheral to the belief system. Those beliefs at the heart of the belief system are the strongest and most resistant to change. In this study, the majority of beliefs which were expressed by the participants could be considered to be at the 'central' end of the 'central-peripheral' axis and therefore, are most resistant to change. Many of these beliefs are what Nespor (1987) classes as existential presumptions and many have an affective and episodic component which contributes to the strength of the belief and its resistance to change. Those carrying out research into the technological beliefs of early childhood practitioners or teachers need to carefully consider the nature of the beliefs held. It sometimes appears that attempts to change practitioners' beliefs about any educational topic are made without consideration of how the educational belief may be underpinned by other, more central beliefs, and as Pajares (1992) proposes, it is important to understand how the educational beliefs held by practitioners are connected to other key beliefs. In this study, the

central belief about the value of family life and the belief of many of the participants that technology was having a negative impact on their family life was significant. Although this study initially set out to understand early childhood practitioners' attitudes towards technology use by young children in early childhood settings, it quickly became clear that the attitudes of the participants towards using technology with the children in their place of work were inextricably linked to their attitudes about the ways in which technology was impacting on their own children, particularly older teenage children, and was having a negative impact on their family life. Many participants perceived technology to be causing problems for their children and for their families, and were unable, in many cases, to view technology use in their place of work separately to this therefore, this relationship between educational beliefs and more central beliefs needs to be carefully considered by those attempting to understand the factors affecting attitudes towards technology.

6.2.2. Implications for Policy

This study has two differing implications for policy. Firstly, it should be noted that the fact that the Statutory Framework for the Early Years Foundation Stage (DfE, 2017) places a statutory requirement on early childhood practitioners to use technology with young children, is not without its opponents. Many experts believe that this should not be the case and this research has found that many early childhood practitioners have a very strong principled pedagogical approach which does not include technology. Many of the participants favoured a very active approach to early childhood education, with heuristic play being favoured for very young children and outdoor play being promoted for those in the preschool years. Activities which have traditionally been a part of early childhood education were highlighted as important such as baking, playing board games, doing jigsaws, playing outside, digging in the mud, reading books, playing with blocks, engaging in role play and singing nursery rhymes. If the participants were able to integrate technology into this active, hands-on, play based pedagogy then they were usually more positive about its use; however, others did not see the need to integrate

technology into this pedagogy and were able to clearly articulate why they felt that technology had little or nothing to offer their pedagogical approach. In developing policy for the early years, the ethicality of attempting to change a practitioner's principled pedagogical approach should be considered. In this study, it was evident that the majority of the participants were basing their pedagogy on careful observation of the children with whom they worked, clear reflection on their principles, and the application of theory to practice through reading and reflecting on a range of books and academic journal articles. For many of the participants in this study, their pedagogy was not just a whim, but the result of careful thought, and therefore, attempting to change this could be considered to be inappropriate or even unethical. Ellyatt (2009) proposes that there is room within the early childhood sector for pedagogical diversity. Indeed, she proposes that 'if we constrain all settings to adhere to too rigid a norm, we run the risk of stifling pedagogical creativity and innovation' (p. 9). In that case, perhaps encouraging pedagogical diversity and valuing the range of principled pedagogical approaches that exist in the early childhood sector is more ethical than forcing those practitioners with a principled pedagogical approach which does not include technology to use it against their pedagogical beliefs. Indeed, Ellyatt (2009) goes on to suggest that such pedagogical diversity is much valued elsewhere in the world and brings a richness to provision and offers parents more choice about the type of provision which they feel is best for their children.

Nonetheless, if early childhood policy makers are determined to include the use of technology in early childhood settings, then a second implication for policy is in relation to the training provided to early childhood practitioners in how to use technology with young children. One of the reasons suggested by many of the participants, when explaining their lack of engagement with technology, was that little or no training was offered to them in relation to technology use. This was particularly the case in the PVI sector where many private day nurseries are struggling financially, and providing CPD related to technology use is low on the agenda. From a policy perspective, government and local authorities should consider the provision of CPD for those working across the early childhood sector in

a variety of different settings, and should consider returning to a model of support for the PVI sector where CPD is provided free of charge by local authorities. In this way, settings could explore more wide-ranging topics without concern as to the cost.

However, this research also suggests that CPD relating to the use of technology in early childhood settings may not always be beneficial. Indeed, a number of participants in this study had engaged in CPD but it appears to have largely been ineffective. The most ineffective types of CPD discussed by the participants were those which took the form of a one-off session with a very confident and accomplished trainer who attempted to show practitioners how to use technology in quite advanced ways, and which only served to confuse many of the participants and convince them of their lack of ability in using technology. The most effective form of CPD discussed by the participants in this study was peer supported mentoring where a more accomplished peer worked alongside a less confident practitioner over an extended period of time, gradually building on their competence in the use of technology. Therefore, an implication for policy may be in considering how best to deliver CPD relating to technology with early childhood practitioners. However, this may need careful thought in the PVI sector where there may not be peers available in the setting with the skills in technology use to be an effective mentor and therefore, mentors may need to come from outside the setting, thus returning to the issue of the funding of CPD.

It may also be useful to consider how, through the use of either formal or informal CPD, early childhood practitioners can be supported to use technology in ways which help to allay their concerns regarding technology. For example, many participants were concerned about the solitary nature of technology use and therefore, providing CPD to help practitioners use technology in social ways may be useful. Additionally, many practitioners were concerned about technology being a very sedentary activity and therefore supporting them to see how technology can be used in an active way might alley some of these fears.

6.2.3. Implications for Practice

As many participants noted, technology is not going away, indeed, it is advancing rapidly, and whether or not practitioners wish to use technology in their settings, it has to be acknowledged that young children will be exposed to technology outside of the setting. Perhaps one of the key implications for practice is in how to support early childhood practitioners as they deal with this pervasiveness of technology and work to support young children in understanding the world in which they are growing up, which will inevitably include technology. This study would suggest that one of the ways to do this would be to support early childhood practitioners to engage with technology in ways which are comfortable to them and which do not undermine their pedagogical beliefs. One way in which this might be achieved is through supporting and promoting the use of what I termed 'active' technologies rather than screen based technologies. Within this study, the majority of participants felt uncomfortable with screen based technologies but were much more comfortable with active technologies such as Bee Bots and other electronic toys, as well as other active technologies such as cameras, video cameras and voice recorders. These technologies are more easily integrated into an active, hands-on, play based pedagogy, so perhaps these are the technologies which will not undermine practitioner's pedagogical beliefs but will work in harmony with them and may provide a way of introducing technology to those who do not feel comfortable with its use in early childhood settings. It may be particularly beneficial to consider how the use of active technologies in the outdoor environment might be supported, as this appears to be a favoured location for many of the participants in this study. However, I would suggest that an attempt to promote more screen based technologies such as computers, laptops and even tablet computers in early childhood settings might result in some practitioners feeling that their values and beliefs are being threatened and may serve to strengthen negative beliefs.

6.3. Reflections and Limitations

It is important to acknowledge the weaknesses and limitations of this study. Firstly, it should be noted that this was only a very small-scale study. Although I had

initially intended to have a larger number of participants in phase two of the research, it proved difficult to recruit a larger number of participants for the interviews across the whole spectrum of views expressed in the focus groups. I felt it was more important to try to equally reflect the views of those who were in favour of technology as well as those who were opposed to technology and therefore, as there were not many participants who were in favour of technology, if I had continued with my original plan to conduct between fifteen and twenty interviews, the data would have been significantly skewed towards negative views. Therefore, in order to keep a balance in the research, only ten interviews were conducted.

A further consideration in regards to this study is that the participants were all studying part time at University to achieve degrees, at various levels, in Early Childhood. The fact that they were all studying Early Childhood suggests that there is a significant engagement with ideas relating to pedagogy and indeed, many of the participants had written assignments at levels four to seven where they had to discuss and reflect on their own personal pedagogy. This may have resulted in the findings in this study being significantly related to pedagogical beliefs. If the study had been carried out with early childhood practitioners who were not engaged in study, this aspect of pedagogy may not have arisen and a very different range of issues may have been raised.

6.4. Further Research

As a result of this work, I would suggest that further research in this area should take account of the views of a wider range of early childhood practitioners, particularly those who have not completed any higher-level qualifications, in order to get a more overarching view of the sector. In addition, much of the research into views about technology has focused, as my research has, on the views of early childhood practitioners or on the views of parents regarding children's use of technology; however, there is little research on the views of the children themselves. Green (2012) proposes that 'in terms of research, acknowledging that

our youngest children are able effectively to participate, share their feelings and make a valuable contribution is essential,' and therefore, including the voice of young children in the research about their use of technology is an important area for future development.

In conclusion, the views of early childhood practitioners regarding the use of technology with young children are extremely varied but are not as simple as being either positive or negative but are extremely nuanced and depend on a wide range of factors. These views have been significantly impacted by the practitioners' beliefs regarding technology, appropriate pedagogical approaches for young children and other, more existential, beliefs such as in the nature and value of family life. However, the majority of the practitioners in this study acknowledged that technology is here to stay and therefore, providing support to early childhood settings and practitioners in how to help young children navigate the technological world in which they live is an important consideration for the future. The key to providing this support is to ensure that it is done in ways which do not undermine the values and beliefs of the practitioners but rather supports their strongly held, principled pedagogical approaches and demonstrates how technology may fit alongside this approach rather than work against it.

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Appendix 1
Guide Sheet for Focus Groups

Begin by putting out a number of different photographs of young children using technology.

1. Ask the participants what they think of the photographs
2. Encourage elaboration on responses

After the photographs have been discussed and discussion appears to be drawing to an end, ask any of the following questions which have not already been covered.

1. How do you feel about using technology with young children in your setting?
2. Why do you feel this way?
3. What benefits can you see technology bringing to young children?
4. What issues do you feel technology presents?

Appendix 2
Guide Sheet for Interviews

Q1 Photo Elicitation

What are your feelings and views when you look at these photos? What makes you comfortable/uncomfortable about them?

Photo 1 Baby with iPad

- Does the age of the child affect how you feel about technology?
- Do you think children are ever too young to use technology?
- What age do you think is appropriate to use technology?

Photo 2 Children with different types of technology

- Does the type of technology affect the way you feel about young children using it?
- Are there certain technologies which you feel are more/less appropriate for young children?
- Why?

Photo 3 Child & Adult Using Technology Together

- Does whether or not the child is supervised affect the way you feel about young children using technology?
- What level of supervision do you think is necessary?

Photo 4 Children using iPad collaboratively

- Does whether or not the child is alone or interacting with other children affect the way you feel about young children using technology?

Are there any other factors that affect how you view technology and young children?

- Duration of use?
- Education versus entertainment?
- Use in the setting versus use at home?

Q2 Personal Timeline

- Ask participants to draw a timeline of their life indicating their own experiences with technology. Talk through the timeline drawn.
- Have your views on technology changed or developed over time?
- Are there any key points in your life which have affected how you feel about technology?
- Have you ever had a significant change in the way you view technology?

Q3 In the Early Years Setting

- How is technology used in your current or previous early years setting?
- How confident do you feel in using technology with young children?
- Do you feel under pressure to use / not to use technology with young children?

Q4 Conclusion

If the participant has been broadly negative regarding technology ask – Can you see any positive benefits of using technology with young children? Expand.

If the participant has been broadly positive regarding technology ask – Can you see any negatives of using technology with young children? Expand.

Appendix 3
Ethical Approval

The University Of Sheffield.

The School Of Education.

Heather Macdonald
EdD Early Childhood Education

Head of School
Professor Cathy Nutbrown

School of Education
388 Glossop Road
Sheffield
S10 2JA

Telephone: +44 (0)114 2228096
Email: edd@sheffield.ac.uk

27 January 2014

Dear Heather

ETHICAL APPROVAL LETTER

Early Years Practitioners' attitudes towards the use of technology in preschool settings

Thank you for submitting your ethics application. I am writing to confirm that your application has now been approved, and you can proceed with your research.

This letter is evidence that your application has been approved and should be included as an Appendix in your final submission.

Good luck with your research.

Yours sincerely

Professor Dan Goodley
Chair of the School of Education Ethics Review Panel

CCProf Jackie Marsh

Appendix 4
Participant Information Sheet

Participant Information Sheet October 2014

Research Project Title:
Early Years Practitioners' attitudes towards the use of technology in preschool settings.

Invitation
You are being invited to take part in a research project examining Early Years Practitioners' attitudes towards the use of technology in preschool settings. Before you decide it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Ask me if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part. Thank you.

What is the project's purpose?
I am currently working towards my Doctor of Education qualification at the University of Sheffield. For my final thesis I am interested in researching practitioners' attitudes towards the use of technology with preschool children. Technology in the lives of young children is a relatively new phenomenon. Over the past 20 years technology has advanced at a rapid rate and prices have come down to such a level that the majority of homes in the UK now have a wide range of technologies used by adults and children. This has resulted, in recent years, in a debate on the impact of technology on the lives of children. On one side of the debate are those who claim that technology is having a negative impact on children's physical, cognitive, emotional and social development, while on the other side are those who suggest that technology can have great educational benefits for children.

This research project aims to examine this debate, focusing on the varying attitudes of Early Years Practitioners towards the use of technology with young children in preschool settings and attempting to understand the range of factors that influence these attitudes. The data collection phase of the research will take place between October 2014 and January 2015.

Why have I been chosen?

You have been chosen as a possible participant in this research because you are currently working as an early years practitioner. I am hoping to recruit approximately 30 participants to take part in phase 1 of the research and from these thirty, fifteen will be selected to also participate in phase 2.

Do I have to take part?

It is up to you to decide whether or not to take part. If you do decide to take part you will be given this information sheet to keep (and be asked to sign a consent form) and you can still withdraw at any time without having to give a reason. There will be absolutely no negative consequences of deciding not to participate in the research.

What will happen to me if I take part?

Phase 1 of the research will take place in October/November 2014 and will involve participants taking part in one 30 minute focus group (approximately four focus groups will run but each participant only attends one group). These focus groups will be made up of approximately 6-8 participants and will provide an informal opportunity to discuss the participants' attitudes towards technology in the early years. After the focus groups I will analyse the information gathered and categorise participants into groups depending on their broad attitude to technology in early childhood, for example, those who are for the use of technology with young children and those who are against it. An equal number of participants will be selected at random from each of the categories and will be invited to participate in phase 2 (approximately 15 participants in total).

Phase 2 of the research will take place in January 2015 and will involve the 15 selected participants taking part in a one to one interview with the researcher which should last no more than 20 minutes. This one to one interview will allow the participants to talk in more detail about how they feel about technology in the early years and explore some of the reasons behind these attitudes.

What do I have to do?

If you agree to take part in the research you will need to attend one of the focus group sessions which will be held in the University of Chester Riverside building. At this session you will take part in a small group discussion about how you feel regarding young children using technology in preschool settings. If you are selected for phase 2 you will also need to take part in a one to one interview with the researcher where your feelings and attitudes towards technology in the early years can be explored more fully. These interviews can take place either at the University of Chester Riverside building or at your place of work.

What are the possible disadvantages and risks of taking part?
There should not be any disadvantages or risks involved in taking part in this research, however, if any issues arise during the research, these will be brought to your attention immediately.

What are the possible benefits of taking part?
Whilst there are no immediate benefits for those people participating in the project, it is hoped that this work will be useful in understanding what influences the attitudes of early years practitioners towards technology use in preschool settings.

What happens if the research study stops earlier than expected?
It is unlikely that the research will stop earlier than expected, however, if this is the case you will be informed of the reasons immediately.

What if something goes wrong?
If at any time during the research you are not happy, please feel free to discuss your concerns with me. If you wish to make a complaint regarding the conduct of the research, you can contact my supervisor, Professor Jackie Marsh, at the University of Sheffield. If you feel that your complaint has not been handled to your satisfaction, then please contact the Registrar and Secretary at the University of Sheffield.

Will my taking part in this project be kept confidential?
All the information that I collect about you during the course of the research will be kept strictly confidential. You will not be able to be identified in any reports or publications. All data collected will be stored in accordance with data protection requirements on a password protected computer which only I can access.

Will I be recorded, and how will the recorded media be used?
I would like to be able to audio record the focus groups and one to one interviews to allow me to listen to them again at a later stage and to aid in the accurate transcription of what was said. The audio recordings of your discussion and interview made during this research will be used only for analysis. No other use will be made of them without your written permission, and no one other than me will be allowed access to the original recordings. These recordings will be stored in accordance with data protection requirements.

What will happen to the results of the research project?
When the research is complete, I will write up the results in my final thesis which will be submitted to the University of Sheffield as part of my Doctor of Education qualification. The research may also be submitted for publication in academic

journals however, please be assured that your anonymity will be respected at all times and you will never be able to be identified from what is written.

If you would like to see a copy of my final thesis you will be able to view this by contacting me and requesting access.

The data collected during the course of this project might be used for additional or subsequent research but will be stored confidentially in accordance with data protection requirements and you will not be able to be identified in any of the stored material.

Who has ethically reviewed the project?
This project has been ethically approved via the ethics review procedure in the School of Education at the University of Sheffield.

Contact for further information
Please feel free to contact me or my supervisor at any time at the addresses below

Researcher	**Supervisor**
Heather Macdonald Faculty of Education & Children's Services University of Chester Parkgate Road Chester CH1 4BK Tel: 01244 511596 Email: h.macdonald@chester.ac.uk	Professor Jackie Marsh The School of Education The University of Sheffield 388 Glossop Road Sheffield S10 2JA Tel: 0114 222 8177

Many thanks for taking the time to read this information.

Appendix 5
Participant Consent Form

Title of Project: Early Years Practitioners' attitudes towards the use of technology in preschool settings.

Name of Researcher: Heather Macdonald
Participant Identification Number for this project:

Please initial box

1. I confirm that I have read and understand the information sheet dated October 2014 for the above project and have had the opportunity to ask questions.	
2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason.	
3. I understand that my responses will be anonymised before analysis.	
4. I understand that an audio recorder will be used to record the discussions and interviews.	
5. I agree to take part in the above research project.	

_____	_____	_____
Name of Participant	Date	Signature
_____	_____	_____
Researcher	Date	Signature

To be signed and dated in presence of the participant

Copies:

Once this has been signed by all parties should receive a copy of the signed and dated participant consent form, the participant information sheet and any other written information provided to the participants. A copy of the signed and dated consent form should be placed in the project's main record (e.g. a site file), which must be kept in a secure location.

Appendix 6
Sample from Focus Group Transcript

	Timespan	Content	Speaker
1	0:00.0 - 0:43.9	Thank you very much everyone for agreeing to take part. What I'd like to do first of all is just to start off by looking at some photographs and just to see how they make you feel, what do you think about what you're seeing here.	Researcher
2	0:43.9 - 0:54.2	I think that's done to keep the child quiet rather than it to be a learning tool or something that you do together.	Kirsty
3	0:54.2 - 0:58.2	Murmurs of agreement. Lots of talking over the top of each other.	
4	0:58.2 - 1:11.4	I think the top one looks a little bit more interactive. it looks like he's playing something, he's interacting, whereas the baby looks like he's just been shoved in front of the TV screen but...	Lisa
5	1:11.4 - 1:14.9	Even at his age I would hope that there would be an adult sort of…	Carol
6	1:14.9 - 1:41.2	But I think how things are now, he looks about one doesn't he, something like that I'd say, and my nephew at that age could work an iPhone easily and that had nothing to do with… It's hard to say with just a picture isn't it because you are making an assumption of what you think, but he could take the phone and you could be sat next to him and not talking to him at all but he could work that phone easily.	Kirsty
7	1:41.2 - 1:49.8	I said this, I noticed this with [son's name]. They could slide a phone, enlarge pictures and close them, but they can't dial on the telephone.	Lisa
8	1:49.8 - 1:59.5	Wouldn't you be sat next to [your son] going 'oh, what does this button do, can you make the phone do this' rather than just...I'm not saying he shouldn't be on it...but I just don't like the fact that he's on it, just sat in the chair.	Carol

Appendix 7
Sample from Interview Transcript

Interviewer: Okay, this next picture has a number of different pictures of different types of technology. I'm just wondering do you feel if any of these are more or less appropriate for the early years, or what are your feelings about these different types of technology?

Julia: Okay. First of all, I love the Bee-Bots. I think they are really good for collaboration. I think they are very child-friendly. You need minimal adult input and then they're off and they work out how to use them and you can just use them for so much. You can use them in literacy, in numeracy. I think they are a really good part of the early years classroom. I love the idea of cameras. I think children taking pictures, exploring their world, because you do get a different perspective when children go out with the cameras. I think they work together well and I know that even in some early years settings, they let them take the camera home which is a good ... (We're not spying on them) [00:05:40] but sometimes it's that you build up a relationship with home and you get to know what they like and what's part of their world, so a big fan of the camera in the classroom.

Honestly, the picture here where he's got the mouse and he's on the chair, my feeling in the early years, practically it's just difficult for children, I think, that they're quite often at tables that are too big for them. They're on chairs that are too big for them. The mouse is too big for them. I would say, from my experience in the early years, we use that less and less now because the practicality of getting them sat up at a table, we just ... we've now moved to using iPads in the classroom because we can have them on our early years tables with our little teeny, tiny chairs. He might be at home, I don't know, but the ICT suites in school are set up for older children.

They are not set up for the early years child, and I think you end up spending half your time getting them sat correctly and you don't get as much done whereas this is, the iPad in the classroom, is instant. Once you've set it up, again, they can work on their own or they can work as part of a group. I am actually a fan of the iPad in the classroom. This boy looks like he's on some sort of ...

Interviewer: Games console.

Julia: Yeah. Not so keen on that. Wouldn't want it in the classroom, I don't think. Again, and maybe it's just my own ... He looks solitary, he doesn't look like he could ... I don't know. I mean, I know you can play with one other person but that doesn't appeal as an early years activity and I don't like this one.

Interviewer: Is it the solitary nature of that that puts you off of that?

Julia: Yes, yeah. Yeah.

Interviewer: That video games are very much on your own?

Julia: Yeah, I suppose so, and it's not something that I've seen in early years settings. It looks more like a home-based ... The thing is, they do all come to school knowing how to do that, but then again, some children have told me some of the games that they've played and you know that they're not age-appropriate. I think there's less possibilities for us to interact as adults to get it, in the early years classroom, to pick the right things for them. I don't know. I don't know as much about those. That's the problem. I don't know. I'm put off, I think, by that.

Appendix 8
NVivo Coding Report

Nodes

Name	Sources	References	Created On
01 Views on technology	0	0	13/06/2016 10:46
1 Positive Views	0	0	13/06/2016 10:46
Positive for Children	0	0	13/06/2016 10:53
Educational	7	15	10/06/2016 10:22
Enjoyment & Motivation	6	23	07/06/2016 11:34
Keeping in touch	5	11	06/06/2016 10:38
Needed for future	10	26	06/06/2016 11:06
Opens up opportunities	9	15	06/06/2016 11:10
Sharing common interest	5	5	06/06/2016 10:22
Supports non conventional learners	8	20	06/06/2016 10:46
Positive for Parents	0	0	13/06/2016 10:53
Keeping parents up to date with setting	7	12	06/06/2016 10:41
Positive for Setting	0	0	13/06/2016 10:53
Makes Teaching Easier	4	6	07/06/2016 12:03
Ticking the box	2	3	09/06/2016 10:17
2 Negative Views	0	0	13/06/2016 10:46
1 Frightening Worrying	6	11	06/06/2016 10:00
2 Electronic Babysitter	11	55	06/06/2016 10:03
3 Physical and Health	7	9	13/06/2016 11:34
4 Social and Emotional	12	54	13/06/2016 11:36
5 Cognitive	12	72	13/06/2016 11:38
6 Moral	14	70	13/06/2016 11:39
3 It depends on...	0	0	13/06/2016 10:47
Age of child	13	29	06/06/2016 11:12
Difference between use in setting and at ho	8	21	06/06/2016 12:11
Duration	12	28	06/06/2016 11:58
Part of a range of activities	10	32	06/06/2016 11:39
Quality of the APP Device	6	10	08/06/2016 13:33
Supervision	13	43	06/06/2016 11:36
Types of Technology	0	0	06/06/2016 11:53
Active Technology eg Bee Bot	7	15	08/06/2016 13:27
Cameras	9	17	08/06/2016 13:59
Computer games	7	10	08/06/2016 14:36
Interactive whiteboard	4	7	06/06/2016 11:55
Ipads better than computers	5	15	06/06/2016 11:53
Music Players	4	4	08/06/2016 13:59
Pretend Technology	2	3	09/06/2016 09:30
TV	5	8	08/06/2016 13:28
What they are doing	10	29	06/06/2016 11:12
Whether its social	14	43	06/06/2016 10:26
Whether its used well	4	10	06/06/2016 10:36
Whether parents and children are educated	5	9	06/06/2016 10:39

Nodes

Name	Sources	References	Created On
02 Factors that impact on practitioners	0	0	13/06/2016 11:19
Pedagogical Beliefs	0	0	13/06/2016 11:27
No benefit	2	2	09/06/2016 09:46
Not necessary in the early years	5	12	08/06/2016 16:24
Philosophic Concerns	3	3	06/06/2016 12:06
Research	5	5	06/06/2016 11:16
There are better ways to work with children	8	23	06/06/2016 11:47
Personal Characteristics	0	0	13/06/2016 11:28
Age	9	16	06/06/2016 10:43
Lack of Confidence	3	4	08/06/2016 14:03
Lack of interest	1	2	06/06/2016 10:45
Lack of skills	7	18	06/06/2016 10:36
Personal Experiences	0	0	08/06/2016 13:40
Amount of Experience	0	0	13/06/2016 11:21
Disrupting family life	6	14	15/08/2016 14:46
Positive Negative Experiences	0	0	13/06/2016 11:22
With own children	7	25	08/06/2016 14:41
Practical Considerations	13	42	13/06/2016 11:27
Access Issues	3	3	09/06/2016 10:14
Changing so rapidly	2	4	07/06/2016 13:19
Children get bored of tech	2	4	06/06/2016 12:24
Children know more than adults	1	2	09/06/2016 12:00
Easily Broken	2	3	09/06/2016 14:44
Funding	4	6	07/06/2016 13:17
It goes wrong too often	6	7	06/06/2016 11:56
Lack of training	4	7	06/06/2016 10:34
Not enough time in the day	3	5	06/06/2016 11:50